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FOCUS ON CFE

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EME JOURNAL



The EME Journal is the magazine of the Land Electrical and Mechanical Engineers, published at NDHQ under the terms of reference of the Director General Land Engineering and Maintenance and the LEME Branch Adviser. The purpose of the publication is to disseminate professional information among members, and exchange opinions, ideas, experience and personnel news, and promote the identity of the LEME Branch.

The EME Journal depends upon its readers for content. Articles on all aspects of the Electrical and Mechanical Engineering System, photographs, cartoons, people news and comments are solicited. Readers are reminded that the Journal is an unclassified and unofficial source of information. The contents do not necessarily represent official DND policy and are not to be quoted as authority for action.

Contributors are asked to submit the original text typewritten, double spaced, paper size as herein. Photos should be sharp, glossy, black and white prints with captions types separately. Personnel should be identified in all cases, both text and captions, by rank, initials, surname, trade and unit.

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IN THIS ISSUE

FEATURES

From the Director General Land Engineering and Maintenance and LEME Branch Adviser	2
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FOCUS ON CFE

● From the Senior LEME Officer Canadian Forces Europe	3
● First Annual "LEME Day" Parade Canadian Forces Europe — 15 May 1985 ...	3
● Repair Parts Command and Control at Unit Level	4
● Life with the G4	6
● LEME in BAOR	7
● EME Wksp CFB Baden	9
● LCMs in HQ CFE	10
● Maintenance Platoon in 1 R22eR	11
● 10 Tonne M.A.N. — A First Line Perspective	15
● UNIQUE UBIQUE — 4 CER	20
● Internal Corrosion of Optical Sighting Equipments	21
● PC versus BSAMMS	23

A TRIBUTE TO THE "TIN TABERNACLE"	24
---	----

LEME ASSOCIATION 40th CONFERENCE	26
--	----

RETURN TO ITALY	27
-----------------------	----

LEOPARD MAIN BATTLE TANK REPAIR AND OVERHAUL AT 202 WKSP DEP	28
---	----

DEPARTMENTS

INFO CORNER	
● A Good Idea But	30

TRADE ADVISERS CORNER	
● Occupational Badges	30

FROM THE DIRECTORATES	
● The Brown Bess Musket — 250 Years Later	31

FOCUS ON PEOPLE	
● Change of Branch Chief Warrant Officer	33
● ADM (Mat) Merit Award — Mr R.T. King, LETE	34
● Medal of Bravery — MWO Forward	34
● LEME Beats Navy at Their Game	35

FORTY YEARS AGO	
● Benny Boob	36

COVER

A 10 Tonne M.A.N. recovery vehicle

From the Director General Land Engineering and Maintenance and Leme Branch Adviser

**Brigadier General
J.G.R. Doucet, CD**

1986 is developing to be a year to remember for the LEME Branch, just as 1985 was a year of growth and development for the Branch. With the formation of the Mat Tech trade and the Canadian Forces School of Electrical and Mechanical Engineering, 1985 saw the Branch developing and expanding its capabilities.

Already in 1986 we have welcomed 25 former Radar Technicians into the Fire Control Systems (Land) trade group. These highly qualified technicians have come to us as a result of the closure of the Pinetree radar stations. They were given the opportunity of a number of options which included remustering into the FCS Tech (E) trade. These technicians range in rank from Pte to Sgt and have a wealth of experience in electronic maintenance. The special remuster program has been set up so that there will be little or no effect on the existing recruitment or promotion quotas set for the MOC 430 trades. It is up to the Branch to make them all welcome.

No doubt you are seeing that there are a number of positions in all the LEME trades that are being left vacant after the APS. Unlike a few years ago, the shortages of personnel are not being caused by high attrition, but because of the rapid growth of the Branch. The establishment of new positions in support of the Low Level Air Defence project, the Leopard Rebuild project at 202 Wksp Dep, and other projects as well as the increase of positions in CFE last year have all added to the strength of the Branch. The problem is that recruiting for a large proportion of these increases could not be actioned prior to them being established. Therefore there are many positions that must go vacant. We are working with the recruiters and the School to find ways to reduce the shortages.

As you are all aware the new uniforms will start to be issued this fall. Along with the new uniform there will be Branch and trade identifiers. FMCHQ has been named as the controlling agency for the Land Environment Distinctive Uniform and as the Branch has been classified as a category one branch, wearing only the Army uniform, our submissions for identifiers are staffed through FMCHQ. We are receiving the utmost co-operation from FMCHQ in being included in their submissions for identifiers. By the time this Journal has gone to press I expect that we will have obtained approval for our trade badges and EME and GEM metal shoulder titles for the dress jackets. Other identifiers such as slip-on titles and cloth shoulder titles will be staffed through FMCHQ to the National Dress and Clothing Committee along with the rest of the FMCHQ submissions.

Last year the CTSs of all the trades were rewritten to conform to the new trade specifications. This year work has begun on implementing the CTSs into CTPs. The new courses which will evolve will mean that the LEME technician will be better prepared to meet the challenge of the changing technology.

In 1986 we will be seeing the start of the end of two of our major capital acquisition projects. We will be starting to field the ILTIS vehicle and the new family of 5.56 mm weapons. At the same time activity within the Heavy Logistic Vehicle (Wheeled) (HLVW) and the Anti-Armour and Light Armoured Vehicle (AALAV) projects will increase.

1986 is going to be a year of progress for the Branch. Not only are we growing to meet the requirements of the CF but we are extending our knowledge to meet the ever changing technology.

ARTE ET MARTE

FROM THE SENIOR LEME OFFICER CANADIAN FORCES EUROPE

The officers, senior NCOs and other ranks of the LEME classification in CFE are particularly proud that this issue of the EME Journal is dedicated to classification activities in CFE. In support of this issue, many of our personnel have taken considerable time and effort to produce interesting and thought provoking articles; I would like to take this opportunity to express my personal thanks for a job well done.

The past twelve months in CFE have been very busy but, none the less, a very challenging and rewarding experience. The introduction of new equipment to CFE, along with imminent programs such as SARP, ILTIS and LLAD have provided many unique and complex personnel and infrastructure problems to resolve. In addition, the CFE personnel augmentation (total — 1200 personnel) has pushed us into a new era in terms of the development

of EME responsibilities in CFE. More specifically, the creation of the Canadian Support Group (Central) has ensured that a dedicated EME third line maintenance organization is no longer a dream.

Despite the above developments, increases to EME establishments have been modest, allowing HQ, static, and field organizations to merely maintain the "status quo". Although the challenge for LEME in CFE in future will continue to be extremely demanding, I am confident that our esprit de corps and professionalism will ensure that we continue to meet our goals and objectives.

As a final point, I would like to add that the scope of LEME in CFE is becoming more and more diversified all the time in terms of posting opportunities. Recently, exchange positions have opened up with the French Army, BAOR, and, of course, with the SARP program in Lieges, Belgium. I believe that this steadily



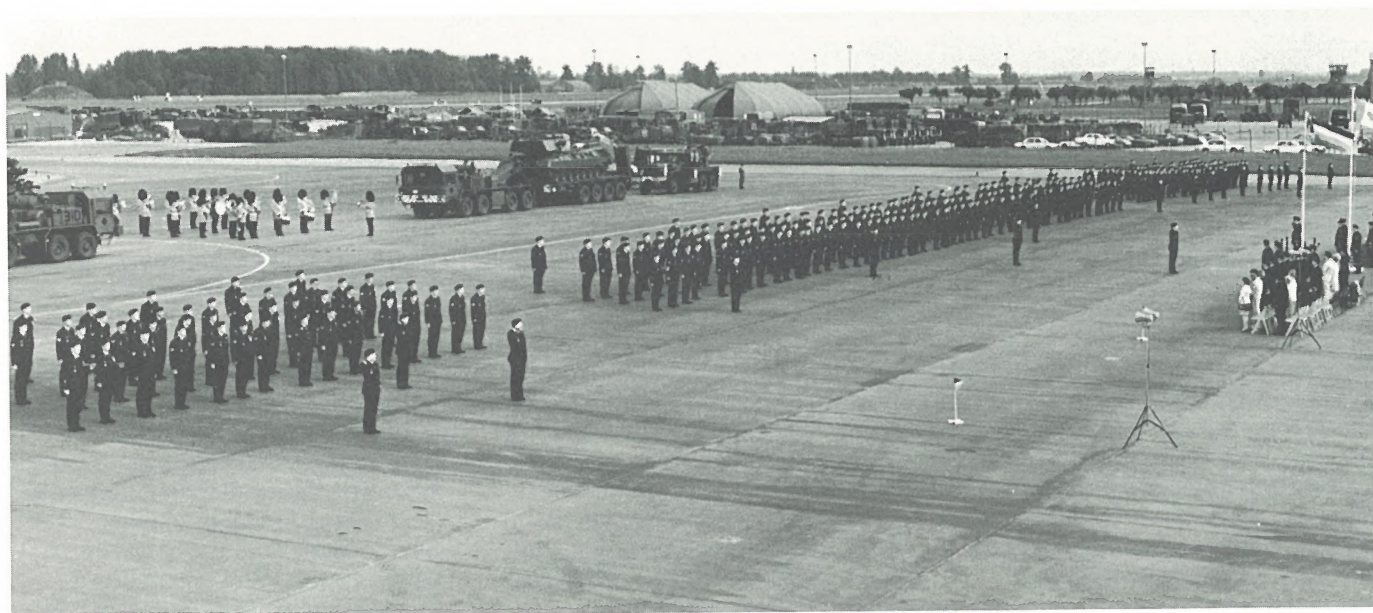
increasing number of exchange/project postings is indicative of not only the wide range of technical, administrative, and managerial responsibilities that our classification encompasses, but also our reputation as a well trained, professional classification. No doubt there are exciting times ahead for LEME!

ARTE ET MARTE

FIRST ANNUAL "LEME DAY" PARADE CANADIAN FORCES EUROPE — 15 MAY 1985

15 May 1985 was declared "LEME Day in CFE" by Commander Canadian Forces Europe, Major-General D.P. Wightman, CMM, CD. This special day was celebrated in an extraordinary fashion, including a parade, sports day and banquet.

In this picture, Lieutenant-Colonel W.J. Brewer (Senior LEME Officer in CFE) advances all CFE LEME personnel, consisting of A Coy — B Maint Lahr and Baden, B Coy — Unit 1st Line Maint, C Coy — 4 Svc Bn Maint Coy, for the advance in review order. The parade was reviewed by MGen D.P. Wightman, Comd CFE.



REPAIR PARTS COMMAND AND CONTROL AT UNIT LEVEL

By Capt I.C. Poulter



The heavy lift 5 ton

The role of the Maintenance Platoon in a Combat Arms Unit (from CFP 314(4)) is to ensure the operational fitness of all unit technical equipment. To do this the platoon must make the best use of the four very valuable resources, namely:

- a. time;
- b. tradesmen;
- c. tools/equipment; and
- d. repair parts.

The intent of this article is to discuss the fourth resource, Repair Parts, and in particular the collective responsibilities for the command and control aspects of the Repair Parts Supply Section of a first line maintenance organization. Throughout this article the example of how the Repair Parts section of the Second Battalion, Princess Patricia's Canadian Light Infantry operates will be used. However, this is not to say that it is an ideal system, but certainly one that works to the satisfaction of all concerned.

In 2 PPCLI the Repair Parts Supply Section (RPSS) is where it should be — part of the Maintenance Platoon organization. It is manned by three supply technicians, commanded by a Master Corporal. They have 3 five ton trucks to carry the repair parts while deployed on operations and, while in garrison, they also operate out of these trucks. This ensures that the section carries its 15 days of parts on wheels ready to deploy and that there are no field/garrison stock rotation and use problems. They do not handle nuts, bolts, screws, or other such standard hardware as this is controlled by the tool crib section. The RPSS is in turn part of Ancillary Section which is commanded by a Warrant Officer, vehicle technician. As such they are responsible to, and indeed work for, through the lines of command, the Maintenance Platoon Commander.

This is not a novel concept and it places the resources (tradesmen and repair parts) in the organization that makes the most use of them.

However, when one delves into the doctrines of Logistics and LEME publications there can be interpreted some differences of opinion.

In CFP 185 (3) Chapter 1, under the responsibilities of a Unit Supply Officer, it states that the Unit Quartermaster is responsible for "the operation of all SSSAs in the unit including the repair parts SSA". Meanwhile, in CFP 314(4) Chapter 3, the Maintenance Officer is responsible for the "management of the repair parts system". Although these doctrines could be labelled as conflicting, I believe that the two doctrines actually compliment each other.

In 2 PPCLI this matter is resolved by the application of the principle of war that is so often forgotten: Cooperation. As a Maintenance Officer the Maintenance Platoon Commander has received sufficient training to be able to understand the basics of the supply system. However, when it comes to providing direction or policy

REPAIR PARTS COMMAND AND CONTROL AT UNIT LEVEL

of a technical nature detailed training and experience are required. This technical expertise is available through the Quartermaster and his staff. They handle all the supply matters for the Battalion and as such are an excellent source of advice and assistance.

Frequently new policy and procedures are passed on the Quartermaster's technical net that also apply to the RPSS. With this help and the technical net, the Maintenance Officer's responsibilities with respect to his RPSS are eased considerably. In

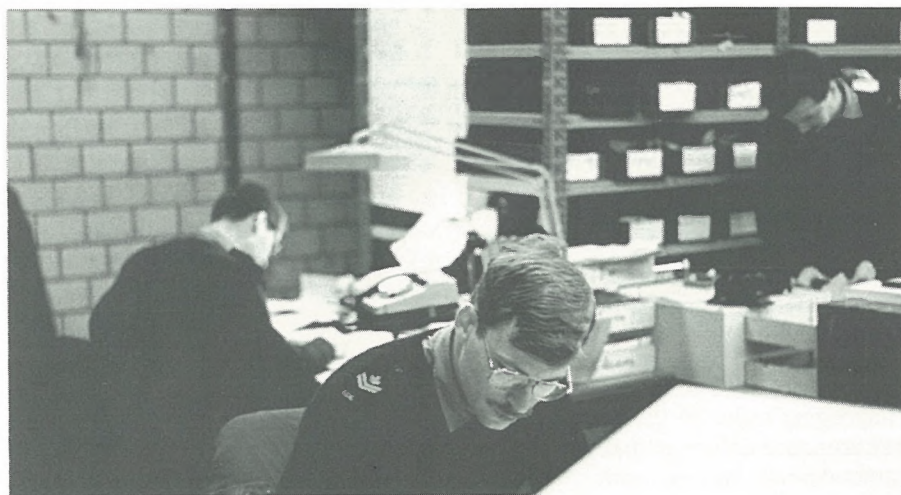
addition, the Quartermaster can also assist in rotation, within the unit, of Supply Technicians to ensure the RPSS receives the expertise required and that personnel don't stagnate and lose interest.

Overall, it is in the best interest of the unit to have an *active* liaison between the Quartermaster and Maintenance Officer so that the best use of personnel and material is made.

With the RPSS being part of the Maintenance Platoon and also being advised, and assisted by the QM staff the best of both worlds apply to the section. The all important technical lines remain open while the Maintenance Platoon Commander is still responsible for personnel management, employment and overall command. Mutual respect and a little cooperation between the two sides of a team make for better operations and production.



RPSS — The link between the technicians and the supply system



RPSS Personnel hard at work



The two binned parts trucks

LIFE WITH THE

G4

by Capt R. Wyville

Since an article has not been submitted from this Headquarters for at least the past few years, I would first like to quickly review the role of the G4 Maintenance. He actually has a variety of duties and responsibilities, no doubt one of the most important of which is technical advisor to the Brigade Commander, his staff and all Brigade units. The G4 Maintenance is also a source of Brigade policy and is responsible for conducting inspections and investigations, issuing instructions, monitoring their execution and reporting back compliance and performance to the Commander. One of the most challenging tasks for the Brigade Maintenance Officer is that of "ombudsman" between unit maintainers and 4 Service Battalion sub-units, Base Maintenance Lahr/Baden and with our Headquarters in CFE. External to the Brigade, he maintains liaison with higher formations such as II (GE) Korps and 7 (US) Corps on matters of maintenance and recovery. He also investigates and staffs UCR's, technical reports, local modifications and in conjunction with the G4 Supply, frequently becomes involved in the investigation of repair parts difficulties. This includes authorization of local parts holding policies and establishment of local control on critical items. When deployed, the G4 Maintenance works as a Duty Officer

in the Brigade Support Cell CP. Finally, he is responsible for coordinating and staffing the user trials on new equipments assigned to 4 CMBG for evaluation and is assistant to G4 on formation safety matters.

As can be appreciated the G4 Maintenance, with his vehicle and communications MWO technical advisors, is kept busy with the many activities associated with equipment maintenance in 4 CMBG.

From my point of view it has always been particularly important that the complementary efforts of the maintenance staff officers, NCOs and Commanders throughout this command has continued to be carefully coordinated through appropriate direction and frequent liaison. Therefore, by briefly describing some of the projects in which we have become involved, I hope to highlight the close interface that exists between the various maintenance staffs and Commanders, throughout CFE.

No doubt that one of the most interesting, ongoing programs in CFE is the 1 ¼ Ton refurbishment and rotation project that began in January of this year. Although Base Lahr and Baden have contracted out for this work it was understandable that 4 CMBG would be required to provide direct support because of the increased work associated with processing our vehicles, particularly in the case of Base Maintenance, Lahr.

This project has required extensive consultation between Brigade, Base Lahr and Baden and, with Headquarters CFE. To assist in quality control, pickups/delivery, scheduling and spare parts chasing, Base Maintenance has been provided a Sergeant and Corporal from 4 CMBG. The project is now well underway and a good product is being returned to the units from contract. Approximately 309 vehicles from 4 CMBG will be refurbished and rotated over the next 2 years.

Running concurrent with the 1 ¼ Ton project has been the sound attenuation kit installation program for the fleet of 5 tons in CFE. This project is also contracted through Base Maintenance Lahr and assistance in administering the project is provided

by the two individuals from 4 CMBG on the 1 ¼ Ton project.

In the spring of this year, through the cooperation of the Brigade Units and professionalism of a group of technicians, this Headquarters successfully completed a scaling project for all the repair parts required for the operational effectiveness of 4 CMBG, in war. This included both the parts for 15 days at first line and 30 days at RPPL. A total of 19 tradesman were employed on this 2 month project, the results of which are being used to identify deficiencies in our present holdings of weapons, FCS, vehicle and communications equipment parts and, in our lift requirements.

Over the past few months MLVW SEV's have continued to arrive and are being issued through Base Lahr to units in 4 CMBG. Similarly, 140 new 1 ½ Ton and 24 of the new kitchen trailers have also been received into 4 CMBG.

In the near future a number of new equipments are expected to be fielded in 4 CMBG. With respect to these projects the various offices involved have once again tried to ensure that a good dialogue exists between interested parties in order that implementation of each program and more importantly, the actual fielding of the equipment, with respect to maintenance, actually goes smoothly.

New M109A2s are scheduled for delivery to 1 RCHA in the summer of 1985. Also during 1985, the Brigade is expecting delivery of the ILTIS and the two new 10 Tonne recovery vehicles.

Other major projects we are preparing for include the TOW II Guidance System modification, the issue of new TOW Night Sights and the SARP program.

In conclusion, I feel that a common ingredient in each of these projects has been consultation, whether the project is still in the planning stage or already implemented. The overall good working relationship and dialogue between the various maintenance organizations in this Command is obviously witness to the fact that we recognize and respect the importance of each others interests and concerns.

LEME IN BAOR

by Capt C.T. Donovan



In August 1984, LEME Branch acquired a new officer exchange position with the British Army on the Rhine (BAOR). A Captain position with 4 Armoured Workshop (4 Armd Wksp) as the 2 i/c of a field force workshop company.

The workshop is located in Detmold, West Germany. Situated under the lee of the Teutoburger Wald, the town dates back to the late 13th Century. Traces of the medieval pattern can still be seen in the present-day layout of the streets and in the framework of many houses. The surrounding countryside is particularly attractive and has much to offer. A pleasant setting, indeed, for a two year posting.

REME COMMAND AND CONTROL

Overall functional control of REME in BAOR is exercised by the Comd Maint BAOR through the Maint Directorate. Comd Maint 1 (BR) Corps has command of all independent REME units operating forward of the Corps rear boundary. In peacetime, he has the additional responsibilities for

training for war of REME units in the Corps and for their operational plans.

Command and functional control of field force workshops is exercised by the formation Comd Maint. REME 1st line support is provided by Light Aid Detachments (LADs) and regimental workshops. Technical direction of these first line REME support troops is exercised by Comd Maint, who is located at divisional HQ.

4 ARMOURED WORKSHOP

4 Armoured Wksp provides 2nd line engineering support to units and divisional troops within 4 Armd Div. The Wksp is organized into a Wksp HQ, three production companies, and a RAOC Stores Platoon. Two of the companies are field force production companies and the other, a static production company consisting mainly of civilian tradesmen.

Like most field force workshops, 4 Armd Wksp is augmented by static civilian detachments. The strength of the civilian detachment is governed by the repair dependancy of the geographic area and the requirement

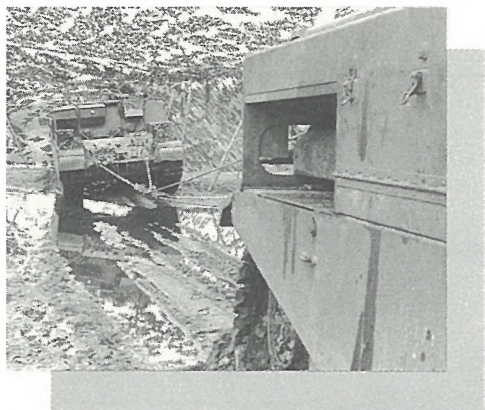
to provide a consistent level of repair services when the military element of the workshop deploys on training. Thus, in general, the bulk of production is provided by the civilian element, allowing a higher priority to be placed on military training for the soldiers.

Second line engineering support to 4 Armd Div is provided by a large workshop, a small workshop, and a station workshop. 4 Armd Wksp, being the large workshop deploys two MRGs and two FRGs into the field. The organization of these MRGs and FRGs are very similarly designed along the lines of a LEME Maint Coy, deviating mainly to accommodate for specialist repairs and equipments. As well, MRGs are reinforced by a Reclamation Platoon. These troops come from the Territorial Army (TA) in the UK. Their purpose being to reclaim re-usable parts from salvage and from battle damaged equipment.

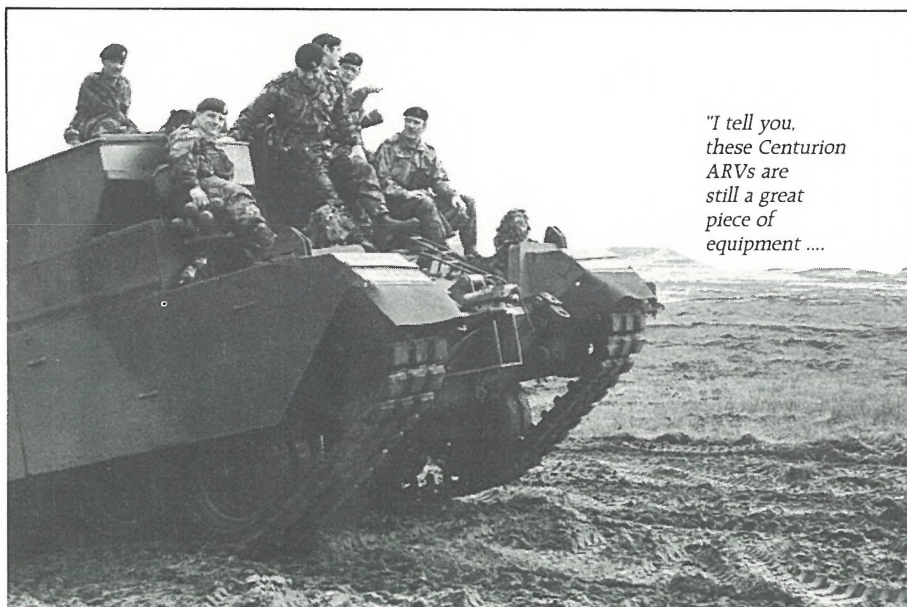
PRE-INTERGRATION

Working with a REME unit is definitely a nostalgic visit back to the

LEME IN BAOR



*...The savings on fuel alone
are tremendous !!!!"*



*"I tell you,
these Centurion
ARVs are
still a great
piece of
equipment"*

pre-intergration era. Boots and putties, the open-hand salute, Craftsman, LADs, and Artificer are still very much a way of life. Unlike LEME units, REME support personnel such as drivers, clerks, storemen, etc. all wear REME hat badges and are integral members of the REME Corps.

The vehicles in use range from the very old to the very modern. For the old buffers, the Ferret Scout car and the Centurion ARV are still actively in service — parts are still a problem and repairs are still as plentiful!

CONCLUSION

A bright spot of any exchange posting is knowing that you are not required to learn a different language. Unbeknown to me, the British Army has a language of its own which any good Sergeant-Major has a vocabulary of over 200 words, the meaning of which is known only to him — "drop-a-bollock", "nackered", "lumbered", "squaddies", "slop-jockey", "scoff", "Drill pigs", "Bundook", "scaleybeck", etc. etc.

As a LEME/REME exchange officer, one gets the opportunity to have a "hands-on" look at how the REME Corps operates and functions within the British Army. Half way through my tour with a field force workshop, I have found it to be an enjoyable, rewarding experience.



"Recognize anyone?"

EME WKSP CFB BADEN

by Capt D.E. Harrison

Located in a scenic setting between the Rhine River and the (Schwarzwald) Black Forest in the southwest portion of the Federal Republic of Germany, province of Baden-Wuerttemberg, there lies an operational air base supported by a crack EME wksp.

The wksp is a combination of EME tradespersons and German civilian mechanics and the organization falls in line with that of a small workshop. The military staff consists of one old officer, five WO's and Sr NCO's, and 18 other ranks. The tradespersons are twenty-two veh techs and one FCS tech. In the very near future an additional two Wpns Techs, one MAT Tech, one Rad Tech and an Adm Clk will be added to the staff. The 14 civilians consist of an inspector, a shop foreman, a contracts clk, a secretary and 10 mechanics. Our top priority, of course, is ensuring that all the Ground Support Equipment is serviceable and available to support flying operations. Our "raison d'etre" is keeping those aircraft on their missions, even though the noise level sometimes reaches the limit of toleration.

The fleet of vehicles we maintain include the following:

- a. Special Purpose Vehicles (44 vehs); and
- b. General Purpose Vehicles (314 incl mules and bombjacks).



B Maint Baden — 1985

Over the past few years CFE has been successful in managing to obtain European Type Vehicles (ETV) to replace a large percentage of the North American fleet. Presently all Snow and Ice Control (SNIC) equipment including plows, snowblowers, sweepers etc is of European manufacture. The rationale is to overcome problems concerning obtaining spare parts on short notice and ease in effecting such things as warranty repairs. As well, most of the commercial fleet is also ETV, except of course for specially designed airfield vehicles used in both Canada and Europe ie. refuellers, mules, fire fighting vehicles, crash crane, extended cabs etc.

On the other side of the house BML is also responsible for all DA equipments on and off base. This

includes three schools in Baden, one in Geilenkirchen and one in Belgium. Needless to say our lone FCS Tech is a busy tradesman.

As if the equipments supported by BML don't keep the tradespersons busy enough approximately 15% of the productive time is spent on war task assignments. Fortunately, or unfortunately, the field background that the branch has afforded our technicians places the majority of them in supervisory roles in BDF duties. Hence once the balloon goes up, maintenance practically ceases while our technicians defend the base. The exceptions are two recovery crews and an SPV crew to provide emergency response.

With all this lost time coupled with a relatively small crew, how one might ponder, does the work get done? Firstly, there is no 0800 to 1630 work day ethos. Work commences with sufficient lead time to afford repairs to vehicles required by personnel who wear wedgies and abuse equipment. Work ceases when nothing more can be done. Secondly, the local contract budget is sufficient to eliminate any backlog to ETV's and DA equipments. A luxury most Maintenance Officers would love to have in Canada.

Other factors that cannot be overlooked and many thanks to the Career Managers, are that:

- a. all our technicians are minimum TQ5; and



Ex Bavarian Fix — Recognize Anyone?

- b. the establishment is manned to 100%.

So you now have the impression that all we do in Baden is work our buns off. Although this is largely true, some of the productive hours are used to enhance other types of military training. We maintain excellent standards in physical fitness and the entire shop, less a recovery crew, does a minimum of 5kms jogging three times per week. As well we use this conditioning to prepare for an annual Adventure Training Exercise "Bavarian

Fix" to test our technicians physical and mental preparedness on a week long trek through the German/Austrian Alps (The Ammerwalds) between Linderhof and Neu Schwantstein. Special amenities are also available to deserving members such as sailing courses at Kiel and skiing (X country and downhill) at Feldberg. When it comes to annual leave the German Reisebuero and Community Services have an abundance of scheduled trips to anywhere your heart desires in

Europe. If all of the aforementioned (including the work) appeals to you then make a special appeal to the CM next time around.

The EME spirit is very much alive and well is CFE. Undoubtedly there is no other branch that has, per capita, the morale and esprit that is found in our MOC 400 tradespersons and with the exception of a few diehards (former wedgie donors) we can hardly wait to parade in our "TAN".

LCMMS IN HQ CFE

by Maj J.A.G. Langlois — SO2 Maint

Unofficially, SO2 Maint and his staff at HQ CFE have been carrying out some Life Cycle Material Manager functions for many years. Now this situation is being formalized in the publication of two Equipment Logistic Directives which delegate to HQ CFE many of the LCMM responsibilities.

Indeed ELD L156 and ELD L196, which are now being written, are clearly defining the LCMM responsibilities which will rest with HQ CFE with regard to Standard Commercial Vehicles — European Type Vehicles (ETVs) and the M.A.N. 10 Tonne vehicle fleet. Both these ELDs have been the object of close discussion between the DSVEM staff and HQ CFE staff involved.

ELD L156 retains the following responsibilities for NDHQ:

- Attrition Warning Report
- Identification of vehicles to be replaced
- Completion of procurement lists
- Obtaining PCB funding approval
- Allocation of funds

It also delegates to HQ CFE/SO2 Maint the following responsibilities:

- Raising procurement specifications and CD's
- Evaluation of proposals

- Introduction of new vehicles
- Technical documentation
- In-Service vehicle maintenance management
- Disposal of old vehicles

Although ETVs are purchased in Europe and HQ CFE has an easier access to the market from a procurement point of view and for follow-on support, it is imperative that the expertise of the DSVEM4 Staff be available to back up HQ CFE. The limited number of personnel in SO2 Maint could not cope with the workload. Furthermore, it would not be practical for HQ CFE to deal with all the NDHQ agencies involved in equipment LCMM work. The separation of responsibilities is therefore based on these limitations and allows a maximum of flexibility to HQ CFE in being LCMM for its ETV, while profiting from DSVEM4's experience on similar equipment.

ELD L196 gives more direct responsibilities to HQ CFE because of the following reasons:

- The complete 10 tonne fleet is fielded in CFE
- The 10 tonne trucks were purchased in Europe and there is no contractor support available in Canada

- There is no reference vehicle in Canada for investigation of technical problems
- All the trained technical specialists are in CFE

Again, the practicality of the situation was the determinant factor in the responsibility split. DSVEM 2 has retained all the typical NDHQ functions in support of HQ CFE, such as:

- Allocation of vehicles and operational control of vehicles distribution
- Establishment of re-utilization rates
- Repair Parts Scaling
- Maintenance Management Information System
- Provision of Technical Policies
- Technical Assistance
- Condemnation decision
- Out of service training funding
- Publication of CFTO's

The publication of these two ELDs is not a new trend, but an attempt to rationalize a situation which has developed through the years. Experience with these arrangements will show the benefits to be drawn from coordinated work at all levels.

MAINTENANCE PLATOON

1 R22eR

Captain Albert Thibert

To say that Maintenance Platoon, 1R22eR, has reached state of the art would be presumptuous, indeed, but recurring successes in annual technical inspections, high equipment serviceability and low user maintenance fault, does indicate an excellent working relationship between both user and maintainer. The organization that has evolved over time in the "Vandoos" is depicted at figure 1. The principal components are clearly the Tracks and Wheels sections with the Weapons and Fire Control System sections forming the remaining production oriented sections. Under the Platoon Headquarters falls the responsibility for Spare Parts, Welding, Tool Crib, Control Office and Platoon CFFET. The most notable elements absent from this chart are the Modification, Inspection and Ancillary Sections.

The inspection responsibility is a controversial issue, to say the least. The various points of view are well known. Decentralizing inspections to the various sub-sections has led to improved maintenance by both user and maintainer and has assured greater vehicle serviceability. The onus is placed on the subsection heads to inspect his assigned vehicles twice a year excluding pre-ATI checks. With the latter checks, this number can vary between three and four inspections depending on time availability.

TRACKS SECTION

The Tracks Section can be said to enjoy the best of both worlds — that is to say, centralized and decentralized maintenance. The Section is responsible to maintain over 130 tracked vehicles distributed amongst four Rifle Companies and three Supporting Arms: Reconnaissance,

Mortar and Anti-Tank Platoon. Presently, an ARVL MRT is attached to each with the exception of Anti-Tank Platoon, which has a standard M113 APC. While detached to their respective companies during training and annual Corps exercises each MRT carries roughly one day of spares. When in garrison and during Hohenfels concentration, all MRTs are regrouped and operate from one maintenance facility. This pooling of resources yields greater flexibility to the Maint O by shifting support should a company be overtaxed with repairs — by say, an arduous exercise or driver training.

Heavy lift capability is provided by a 5 ton HIAB vehicle which doubles up as a heavy parts carrier and special MRT. This additional MRT along with two other tracked vehicles forms the forward repair elements when the A Echelon sub-divides into its two components: A1 and A2 Ech respectively. This splitting occurs primarily when the Battalion is on the advance or when the Echelon cannot keep up with the F Echelon.

WHEELS SECTION

The Wheels Section is responsible for over 83 wheeled vehicles all types, 58 trailers and 31 generators. It is subdivided into four sections with each supported by an MRT. The 5 ton MRT doubles up as a recovery and 5 ton repair team. All support is provided from the Echelon. Repair requests are filtered to the Control Office from the Company CP via land line and applicable MRTs are dispatched complete with needed spare parts obtained from the co-located Parts Section.

An added responsibility of this Section is to provide perimeter security for the Echelon and guarding

the out route. Always the last section to come in from exercises this Section prides itself in rarely leaving a casualty for second line recovery.

WEAPONS AND FCS SECTIONS

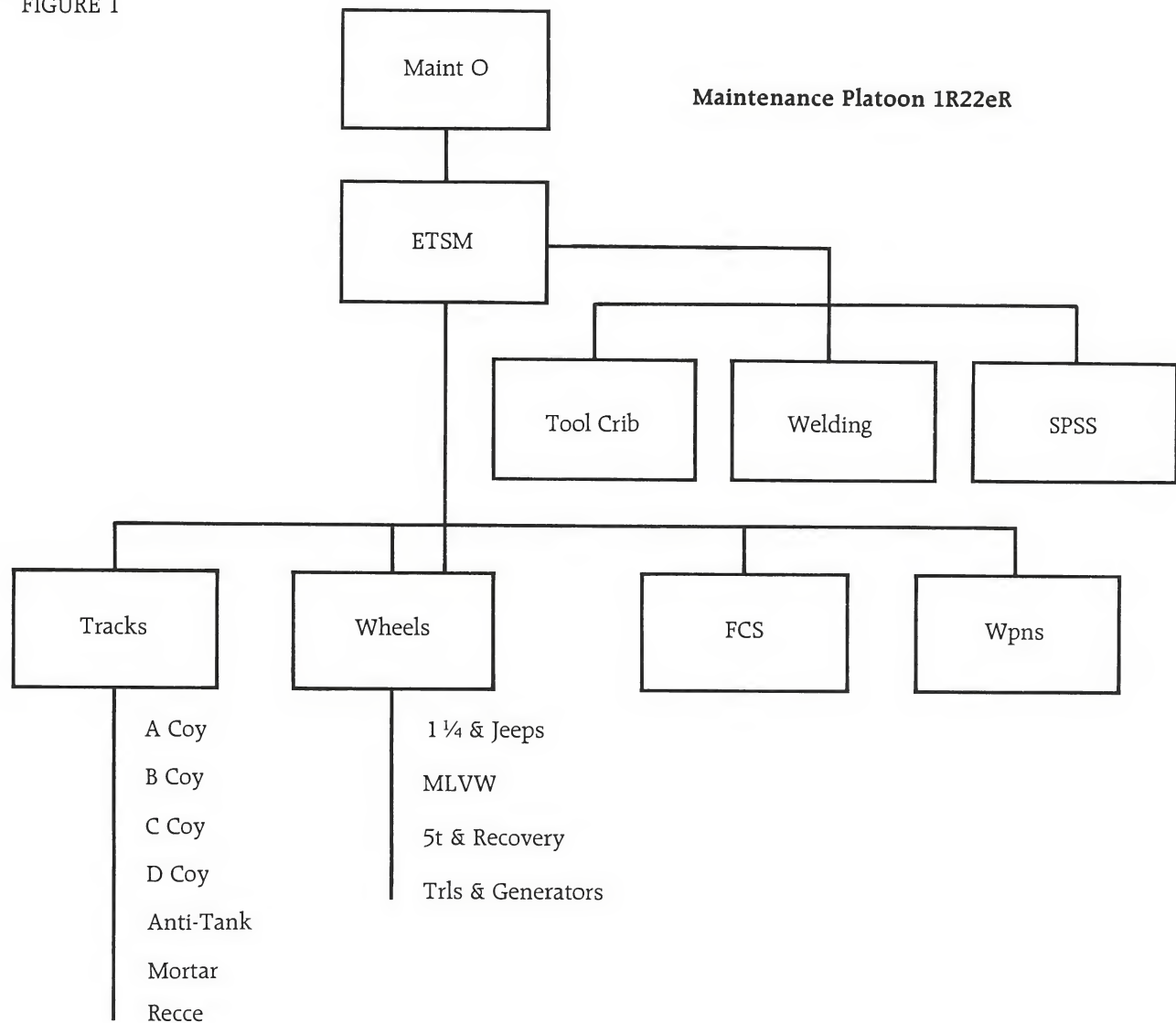
These two sections are equally manned with four personnel: one sergeant, one master corporal and two corporal/privates. A close rapport with company quartermasters and periodic inspections of all Battalion weapons and FCS equipment ensure a high degree of operational readiness. This year's ATI result for all FCS equipment yielded a whopping 98% excellent result — an exceptional achievement to say the least.

SPARE PARTS SECTION

"Have you checked with the Vandoos? . . ." — this sentence uttered as a last resort often yields positive results when all other sources of supply have failed. No other group of technicians is more aware of this unofficial supply system than those in 1R22eR. Though scrounging is not to be recognized in any CFPs the end result often justified the means. The spirit of collaboration between technicians of various units will lead to reduced down time thereby enhancing overall Brigade readiness. A large part of the responsibility for this excellent reputation must be borne by the three Supply Technicians making up the Platoon's Spare Parts Section. The Section maintains a fifteen day supply of parts on three 5 ton vehicles. Essentially two are stocked with track vehicle parts and deploy with A1 Ech elements. The third vehicle stocked with the remaining parts is co-located with the echelon and effects liaison with Repair Parts Platoon of 4 Service Battalion.

MAINTENANCE PLATOON 1 R22eR

FIGURE 1



CONTROL OFFICE

The activity center of the Platoon of course is the Control Office. All first line requests and second line demands are coordinated from the Platoon CP. When on field exercises the ETSM is exempt from CP duty and devotes all his energies to the control and taskings of repairs. This leaves the Maint O free for sleep and CP duties — all in all a fair working arrangement, or is it?

FACILITIES

Depicted in the photographs are the old and new Platoon garrison facilities at the Lahr Airfield building B132. The extension was built around the Spare Parts Section to allow for three 5 ton parts vehicles to be backed up against the building and give the Supply Technicians direct access via a loading dock located inside the building. This unique concept within first line organizations of 4 CMBG will greatly

enhance reaction time on alert recalls by permitting all parts to be left on the vehicles while the unit is in garrison. In addition to a new Spare Parts Section the Platoon will be getting a Battery Shop and a Welding Shop large enough to accommodate a 5 ton wrecker.

Not wanting to sound derogatory; but, to give an idea of the time required to complete a project of this magnitude, initial plans were

MAINTENANCE PLATOON 1 R22eR

submitted in 1975 and ground breaking ceremonies were performed in November 1984. For those envious Maintenance organization, there is no better truth than the maxim "plan early". Good news for the incumbent Maint O in 1990 — you'll enjoy your new offices.

SPORTS HIGHLIGHTS

Discussing Maintenance Platoon 1 R22eR without touching upon its sporting achievements would not do it

justice. A favorite past-time of the Brigade units is to attempt to defeat the reigning Brigade sports day champions for the last ten years. Without seeming to brag, the Platoon has enjoyed a certain measure of success in the LEME day competitions as well. One only has to peruse over the LORE/LEME cup to ascertain the stiff competition put up by the Platoon. The only events conceded in the 1984 competitions were to the gigantic Service Battalion First Line

tug-o-war team and to the elastic Base Maintenance Volley-ball team. All other meets were taken including the 50/50 draw.

One trophy which will be defended with vigour this year will be the Annual First Line Hockey tournament. Not even the gigantic Service Battalion First Line team will be a match for the illustrious "Benchwarmer" Thibert, "Dumbo" Gauthier and "Rocket" Gagne.

ARTE ET MARTE

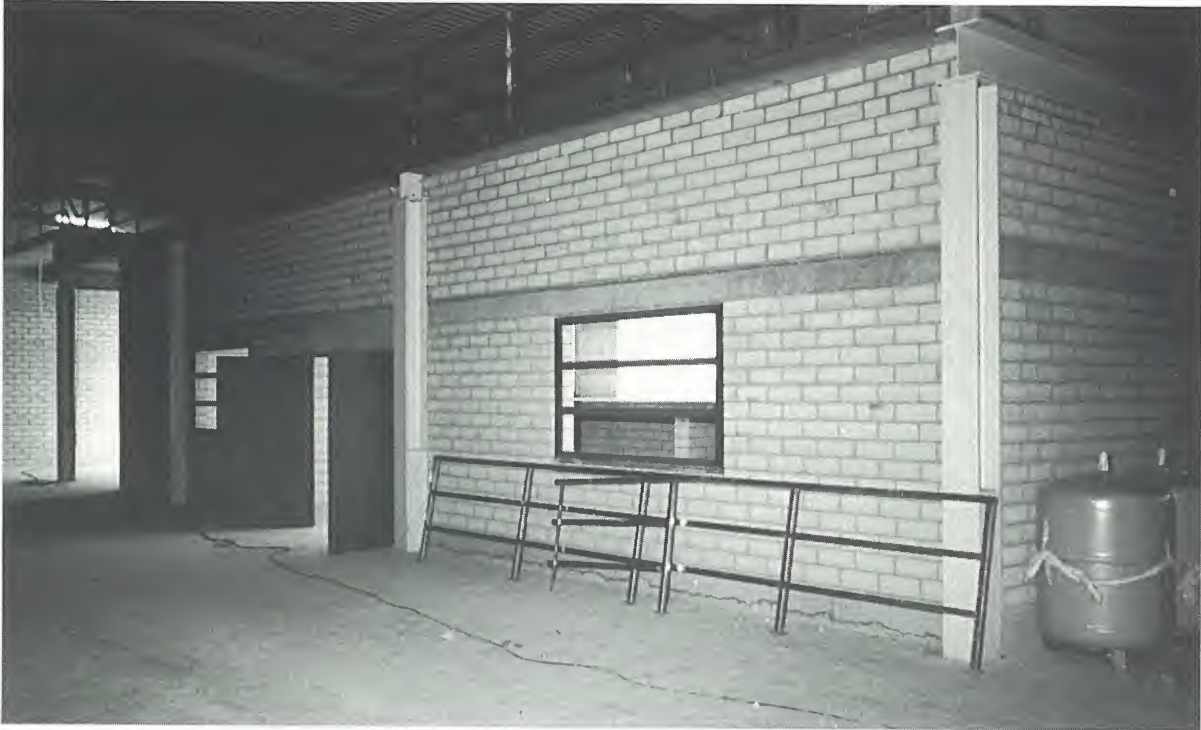


New extension clearly showing the two main access doors, the Spare Parts Section loading bays and on the far right the main access door to the Welding Shop.



The new Spare Parts facilities with the internal loading ramp.

MAINTENANCE PLATOON 1 R22eR



The Spare Parts facilities viewed from inside the garage. Of interest is the improved storage space located on top of the Spare Parts section and which runs the whole length (width) of the garage extension.



Though crowded at this time, additional space will be gained when the far wall is removed to give access to the 15 meter (45 foot) extension. Occupancy will begin in early June 1985.

10 TONNE M.A.N.

A FIRST LINE PERSPECTIVE

By MCpl Bruce Baker — 4 Svc Bn



Shown above is one of the two new 10 ton Wreckers received by Maintenance Company in July 1985. These vehicles are produced by M.A.N. and shall be employed in FRG. In the picture are, from left to right, Cpl Little, MCpl Pettipas, Maj Beselt, MWO Fardy and Sgt Wright.

The 10 tonne M.A.N. truck was purchased by Canadian forces Europe as a result of a requirement to provide 4 CMBG with a greater lift capability without increasing the vehicle and personnel establishment. M.A.N. (Mechanik Fabrik Augsburg Nurnburg) company was contracted and asked to produce three types of vehicles using their basic military design combined with minor Canadian specification changes. Three types were purchased: a plain cargo carrier, a cargo with crane, and a recovery vehicle.

Now that we have a fleet of M.A.N. trucks within the forces, how does the

411 LEME technician fit into the grand scheme of operational flexibility, and inter-operability etc? In order to fully appreciate the impact of this new vehicle within our ranks one must first understand that the length of time from rumour stage to the arrival of the first vehicle was less than 12 months. Perhaps a time frame as short as this, from the talking stage to actually working and operating the truck could find its way into the Guinness record book. However, the initiating of a training package, parts procurement, along with a multitude of other necessities left little time for documentations or trivialities. When

most members of 4 Svc Bn began preparing for Heuburg gun camp, 12 stalward members of LEME set out to undertake a TSQ 411.15 course from 14 May to 15 June 84.

Visions of untold delights awaiting in the city of Munich soon evaporated, as the maintenance personnel of course 8401 arrived at the M.A.N. training center located in the pleasant village of Unterfurhing.

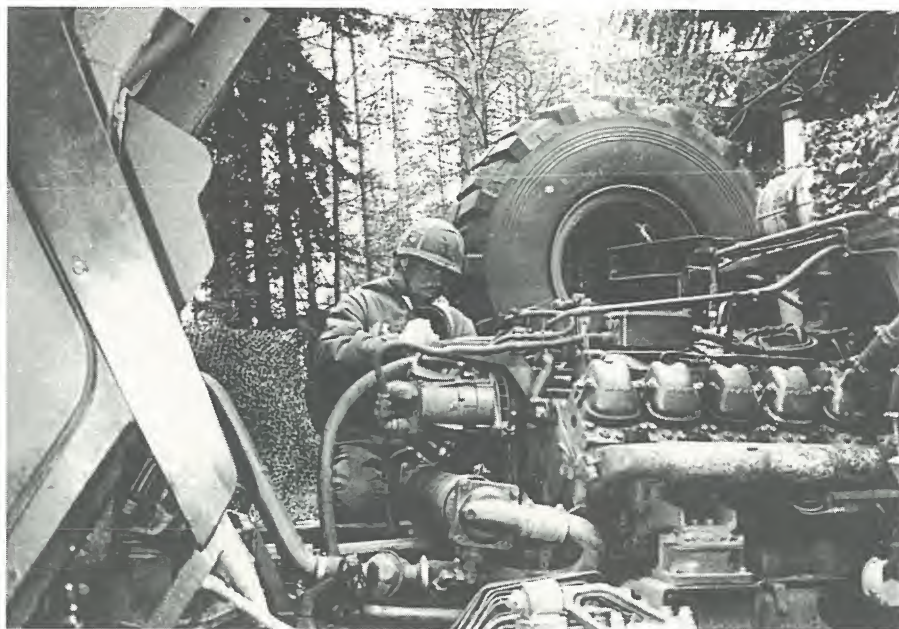
Like most technical courses, day one began with the explanation of content, meeting of the instructor (Herr Kifner) and other generalities. The next few days were devoted entirely to the location and

10 TONNE M.A.N. — A FIRST LINE PERSPECTIVE

identification of components, lubrication points, and a general look at the entire vehicle.

It wasn't long before someone discovered the entire cab tilted forward, and we received our first look at the engine. Apparently Herr Kifner was unaware that perfectly serviceable equipment should never be tampered with and he quickly dispatched us to remove the engine. Some three hours later, after all disconnections were made, we then prepared the sling to lift and remove the engine. Obviously our instructor was in fact aware that tampering with serviceable equipment does have its drawbacks, and decided before any further dismantling took place, we should reinstall the assembly. Whether his decision not to completely remove the engine was influenced by the trainees discussing the merits of standard vs metric, or G.M. over M.A.N. during the disconnecting process will never be known. However it was noted he did look relieved when the vehicle successfully moved under its own power at the end of the day.

The next day a D2840Mf engine on stand was conveniently discovered in the school's EPR room. Armed with provisional manuals, all students became heavily involved in the complete disassembling of the engine. The V10 diesel works on a 4 cycle principal incorporating a direct fuel injection system. The centre of each piston has a bored spherical combustion chamber and all cylinders are pressed fit into the block. The importance of ensuring the cooling system is completely free of air was vividly demonstrated during the engine rebuild. A cylinder removed from a vehicle with air in the cooling system showed metal cavitation along the outside cylinder wall. The life expectancy of an engine with this problem is reduced dramatically.



Cpl Ken Staples tightens the oil filter on a 10 tonne M.A.N. Because the oil line is a solid piece there have been problems with vibrations causing cracking of the fittings. Photo taken during 4 Svc Bn FTX RANGE RIDER '85. (4 Svc Bn photo by Cpl Brad Goatcher)

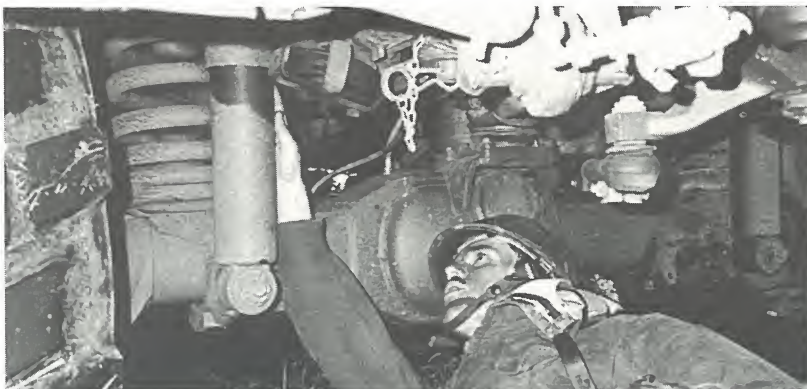
10 TONNE M.A.N. — A FIRST LINE PERSPECTIVE

Needless to say, all students paid strict attention to the procedures for bleeding the cooling system.

After spending several days in EPR a representative from ZF transmission (Zahnradfabrik Friedrichshafen AG) arrived to explain, disassemble and reassemble the gear box, transfer case, clutch and torque converter of the A.F.'s power train.

The vehicle utilizes a 4 speed syncromesh transmission with planetary gear grouping giving the transmission eight forward speeds. (4 low — 4 high range). The clutch is a dry single disc type, octuated by air over hydraulics. Re-assembly, even in the classroom proved complicated as a great deal of care must be exercised with the precision fit of components. Second line personnel attending the course discussed in great length problems that could be encountered trying to replace a clutch in the field environment.

The next phase was spent on the remainder of the drive train. The 10 tonne's four axles are all powered. The front two axles are steerable with planetary hub reduction gears and differential locks with a 7 ton capacity. The intermediate and rear axles have a 13 ton capacity and also incorporate the planetary hub reduction system. Since the transfer case and differential locks are not syncromesh, the vehicle must come to a full stop before the driver can electrically engage the locks from the cab.



Shock absorbers showed a tendency to leak on the 10 tonne M.A.N. Here Cpl Ken Staples examines a suspected leak during 4 Svc Bn FTX RANGE RIDER. (4 Svc Bn photo by Cpl Brad Goatcher)

At the conclusion of the drive train package, we began the theory section of the brake system under the expert tutelage of another instructor Herr Rector. This phase was very interesting, however strict attention was required throughout his lessons. On more than one occasion Herr Rector innocently required the assistance of a student to help him trace the air circuits and describe the function valves to his satisfaction. The 10 tonne employs two major air circuits, but in fact actually breaks down into four circuits which include everything from service brakes to the drivers seat. The front axles incorporate an air over hydraulic system with self adjusting wheel cylinders. The rear brakes are a

straight air brake system. M.A.N.'s excellent training aids went a long way in clearing up any problems students may have encountered during this phase.

No course would be completed without an electrical package, and the training centre saw to it that everything was included. The only similarity between most SMP vehicles and the 10 tonne are they both have a 24 volt system. Wiring is not color coded, and it became necessary to understand the importance of the European wiring numbering system in order to read the electrical schematics. As most of the provisional manuals available were in German, Herr Kifner's assistance proved invaluable during this period. How many of us would have realized before the course that Steuerralaix is a control relay, or Haltewicklung meant the hold-in windings? The majority of power circuits in the vehicle have circuit breakers, which are centrally located and conveniently placed behind the driver's seat. The vehicle has a great many sensors, sending units, electrical junction boxes etc, and reading an electrical schematic is a necessity for fault finding. Once again M.A.N. had exceptional training aids available for their electrical package.

Five weeks passes very quickly when interest and enthusiasm is maintained at a high pitch. Upon completion of the course maintenance platoon technicians were allowed a few weeks breathing space before the



During Op Shell Drake, tires showed a tendency to wear excessively on the outside and inside pads. This may have been due to the necessity to use these off-road tires in sustained autobahn driving conditions. Here MCpl Bruce Baker and driver Cpl Norm St. Maurice examine a tire for worn pads during 4 Svc FTX RANGE RIDER. (4 Svc Bn Photo by Cpl Brad Goatcher)

10 TONNE M.A.N. — A FIRST LINE PERSPECTIVE

initial 35 vehicles arrived in 4 CMBG prior to FALLEX 84.

PRE-ISSUE INSPECTIONS

Pre-issuing the new vehicles involved the replacement of all filters, draining of all levels and a complete 1134 inspection. Supply and Transport Coy assisted in this project by supplying two sections of MSE personnel who had previously attended a 10 tonne drivers course in Munich. The M.A.N. repair facility in Offenburg also supplied a mechanic to ensure the inspections met company standards and offer assistance to the military mechanics.

Although no major problems were encountered during this period, inspections proved time consuming as draining the planetary hubs required several hours per vehicle. The differential drain plugs were excessively over torqued and approximately 6 stripped plugs required removal by drilling and extrication.

The co-operative effort between drivers and mechanics resulted in all vehicles being completed in just over two weeks. S&T Coy was now ready to deploy for FALLEX with 35 new 10 tonnes in their inventory to support 4 CMBG.

FALLEX

FALLEX 84 proved interesting and unusual for the MRT's supporting the new vehicle. In lieu of parts, parts manuals, or repair manuals the mechanics departed still carrying the provisional repair manual and a map of all M.A.N. servicing centres in Germany. Since TSQ 411.15 dealt mainly with third line repair, maintenance now took on a new meaning for the technicians. When confronted with a particular vexing problem, more than one mech was jokingly heard to mutter "where's Herr Kifner when we really need him?" The majority of the labour devoted to 10 tonnes throughout FALLEX consisted of minor adjustments, and replacing a good many signal flashers because of burnt contacts. One transmission was replaced complete by dealership because of an internal breakdown. Every day was a learning



Even 10 tonnes are not impervious to damage from hitting trees in the bush. The width of these vehs caused some problems moving into locations. Here Cpl Ken Staples examines a torn tank strap and damaged fuel tank on a 10 tonne M.A.N. Photo taken during 4 Svc Bn FTX RANGE RIDER. (4 Svc Bn photo by Brad Goatcher)



Hydraulic cab lifter locks have also shown leaks. Here Cpl Ken Staples tightens the mount on a hydraulic cab lock. during 4 Svc Bn FTX RANGE RIDER. (4 Svc Bn photo by Cpl Brad Goatcher)



Cpl Ken Staples and Cpl Norm St. Maurice examine the functions of the controls of a 10 tonne M.A.N. crane. Problems with the lack of response from the controls have caused

warranty work by the local dealers. Photo taken during 4 Svc Bn FTX RANGE RIDER. (4 Svc Bn photo by Cpl Brad Goatcher)

10 TONNE M.A.N. — A FIRST LINE PERSPECTIVE



Cpl Ken Staples examines a tire for wear on a 10 tonne M.A.N. Note the pad he is pointing to is considerably worn down compared to the others. Cab is in the tilt forward position which allows easy access to work on the engine. Photo taken during 4 Svc Bn FTX RANGE RIDER. (4 Svc Bn photo by Cpl Brad Goatcher)

experience, and everyone realized in order to effectively maintain this vehicle the more "hands on", the better.

WINTER

The winter 1984/85 will long remain in the memories of those stationed in Lahr as being cold and miserable as the winters that can be encountered in most areas of civilized Canada. As the temperature decreased the amount of defects for the new vehicles increased. The biggest problem involved trucks being unable to start. It was discovered that diesel fuel was breaking down because of the frigid temperatures and a metal strainer type fuel filter was becoming clogged with wax and ice. Any prolonged attempts to start the truck tripped the fuel solenoid circuit breaker. Replacing the fuel filters and ensuring the fuel was free of water rectified this problem.

The interior heaters on numerous vehicles also failed during the cold weather. Any attempt to engage the heater resulted in the circuit breaker tripping. Further investigation revealed ice had lodged between the exterior intake grill and the heater motors. The ice prevented the fan blades from turning and in two cases the fan motors were rendered unserviceable and required replacement. Users were informed to keep the intake grill free of any ice buildup which in turn prevented this problem from occurring again.

Other than the fuel problem all vehicles stood up well to the cold weather during the winter. This was more than could be said for many members of the local population.

OPERATION SHELDRAKE

S&T Coy was tasked with an ammunition outload operation which took place from 14th to 25th April 1985. The vehicles drove approximately 400 autobahn miles per day. This would prove to be their biggest test to date. Within the first several days, the front tires began to wear excessively. The tires are principally designed for off-road purposes, and sustained highway driving under loaded conditions

resulting in excessive wear to the outside edges the front tires. Worn tires were rotated from front to rear on 10 vehicles, and all tire pressure was increased from 3.5 to 4.5 Bars. Reducing the speed of convoys and restricting them to 70 KPH or less, rectified this problem.

Coupled with tire wear was shock absorber leakage. Seven vehicles required shock absorber replacement. Further observation will determine if this is an inherent condition with these components.

A more serious problem arose with oil line fittings between the oil filter housing and the engine. The fittings had a tendency to crack or back-off, and is believed caused by engine vibration. Seven months prior, an engine required replacement for this problem, however there had been no re-occurrence until this time. In all, 13 vehicles required dealership maintenance to alleviate this defect. One particular vehicle had fittings replaced three times. M.A.N. maintenance personnel resorted to using heat to fully secure the fitting which finally cured the problem.

Although going several days behind schedule because of vehicle downtime, a great deal was learned by mechanics and drivers alike. Growing pains are expected with any new type of equipment, and a vehicle as complex as the 10 tonne M.A.N. is bound to have it's share.

As the first year of ownership rapidly comes to a close with the 10 tonne, so does the manufacturer's warranty. Repair manuals and parts will soon become available in the system and one can only look forward to the future with enthusiasm.

The introduction of the M.A.N. diesel is yet another welcome addition to the Forces. The benefits to Canadian Forces Europe are twofold. It has successfully provided the much needed requirement for a greater lift capability, and indoctrinates the 411 into a more technologically advanced wheeled vehicle.

From the intricacies of the 2 ½ ton GMC to the mechanical advances of the M.A.N. 10 tonne, one cannot help but feel "We've come a long way LEME".

UNIQUE UBIQUE



by Capt N.R. Bradley,
Maint O 4 CER

4 CER is certainly unique in many ways and definitely lives up to the Engineer motto, UBIQUE — "Everywhere". The unit maintains a high level of operational readiness both through maintenance and training, thus making it capable of performing its role anywhere in Europe.

Probably the most unique aspect of 4 CER is the unusual types of equipment it has, some of which are to be found nowhere else in the Canadian Forces. Examples of these are a Saturn Crane, Leopard Bridge Layers, Drott 45 Excavators, D700 Bulldozers, Astro Lowbeds, FELs, Volvo Grader, assault boat motors and a ROTORK boat. As can well be imagined this diversity of equipment presents a tremendous challenge to the maintainer both from the parts procurement and the maintainability point of view.

Parts availability has a profound impact on our capability to keep the equipment in a serviceable condition. The parts for one-of-a-kind vehicles such as the Saturn Crane can take up to six months or more to obtain. This is mostly due to the difficulty of supply to identify parts that are not registered in the system. A high volume of parts must be purchased LPO and it is necessary for the Vehicle Techs in Heavy Equipment section to liaise continually with Base Scaling to identify and log items. In fact approximately 50% of their time involves doing just that. Some parts just do not exist and quite often a manufacturer's representative must visit in order to effect repairs.

A large quantity of parts must be carried in order to support the varied equipments. It is interesting to note that although 4 CER is one of the smallest units in 4 CMBG it has to manage one of the largest spare parts accounts with over 4500 line items. To carry all the parts when deployed is very difficult. It is necessary for some MRTs to stock more than is normally required to help distribute the load.

Of course having enough trained technicians to work on this equipment is a critical problem. While it is not unusual to have personnel posted in that have the Leopard Tank qualification it is extremely rare to find one with the AVL B Bridge qualification. The launch system is computerized and complex in design. Courses are few and far between, usually only once a year, depending on the demand. Having limited technical manuals for some unique equipment requires the technician to utilize his full trade knowledge to analyse, detect and repair faults. The operators have to be extremely knowledgeable on their equipment and quite often help the Technician in his diagnosis and repair. Expedient repair is a must. The inoperability of critical equipment such as the Bridgelayers have a profound effect on the Brigade Commander's operational plans.

Naturally, operational readiness is not only attained by the technician doing his job. It is to this unit's credit that maintenance is given a high priority. From the Commanding Officer down, it is emphasized that the ability of 4 CER to perform its

Engineering role is dependant in its equipment being fully maintained. We have a comprehensive maintenance program where every Tuesday morning is dedicated to operator maintenance. The operator goes through a four week inspection checklist that covers all areas of the vehicle. On the fifth week he checks all other equipment such as weapons, small engines etc. On the sixth week the procedure starts over again. Additionally, there are periodic intensive maintenance days where two or three days are dedicated solely to maintenance, usually before or after an exercise. This year Maintenance Troop conducted a maintenance course for all officers. The aim of the course was to familiarize the officers with PM indicators. It was very successful as Troop Commanders now use that knowledge when inspecting to ensure their personnel are doing the proper maintenance checks.

To enhance the combat capability of 4 CER, a high level of physical fitness is stressed. The unit has a good comprehensive fitness program that is conducted every morning except Tuesday — maintenance morning.

The soldierly skills are not forgotten either as Battle PT is conducted every Thursday morning. During exercises Maintainers get a change to participate in assault water crossings, patrols, preparing mines at mine caches and playing enemy. Maintainers are included in all physical training and most other activities along with the Sappers. This contributes to the fact that the maintainers of 4 CER are probably the fittest soldier/maintainers of 4 CMBG.

In summary the unique equipment and the inherent parts procurement problem create a challenge for the maintainers of 4 CER. It is a challenge that is readily met. Developing the soldier skills are a part of our day-to-day life. Forget not that LEME personnel are soldiers and maintainers as epitomized in our motto ARTE ET MARTE, — by skill and by fighting.

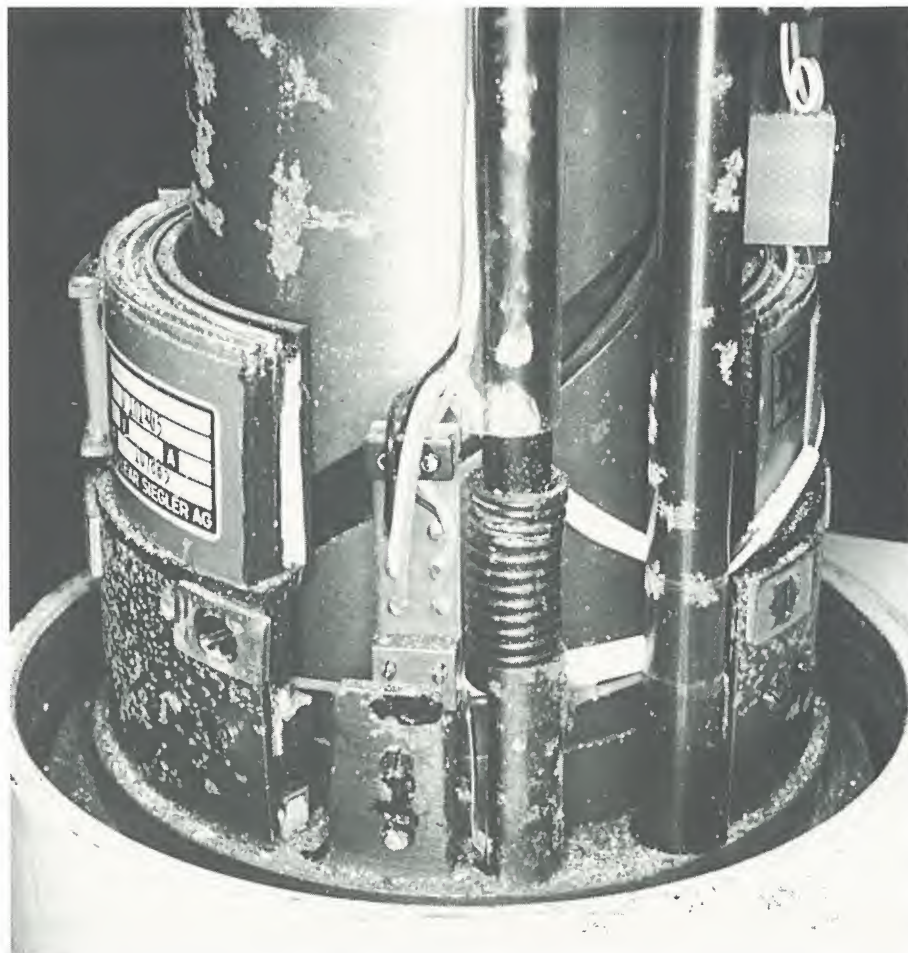
INTERNAL CORROSION OF OPTICAL SIGHTING EQUIPMENTS

by WO S.A. Marr

As gun sighting equipment becomes older Fire Control System Technicians find the task of maintaining these equipments more difficult.

New equipments are easily maintained by a straight forward set of factory or manufacture's servicing and warranty notes. But as equipments age, chronologically or by usage, a whole new set of maintenance fault parameters emerge. Straight electronic equipments for the most part are affected only to a small degree by age. Electrons have little tendency to slow down, fade, rust, or shrink. However, the precision-mechanical, electro-mechanical, and optical-mechanical equipment's accurate performance is directly proportional to its age and usage.

To put into proper perspective the term "precision-mechanical", imagine two miniature gears, whose task is to transmit the elevation angle of their main armament to a resolver, which converts the mechanical signal to an electrical one, for use by a computer. Suppose the meshing surface contains a few miniscule particles of sand, or has been pitted by rust, and that when these irregularities come into contact during normal rotation of the gears, a deviation of two mils is transmitted in addition to the correct angle signal. Now, a two mil error may not be cause for alarm in normal circles; but suppose you are an experienced gunner who is engaging a target at a distance of 2,000 meters, and the elevation of your main gun is being transmitted through this irregularity. As your round whistles down range so does your reputation, for a two mil angle deviation at a distance of 2,000 metres equates to a four (4) metre miss.



*TRP2A Panoramic Telescope
Showing corrosion at top of lower housing*

INTERNAL CORROSION OF OPTICAL SIGHTING EQUIPMENTS



*TRP2A Panoramic Telescope
Interior corrosion of
panoramic head*

*TRP2A Panoramic Telescope
Interior, showing corrosion*



*TRP2A Panoramic Telescope
Showing interior corrosion*



Just an example you say.

The purging and dessication of the optical instruments is a growing concern among maintenance staff. As the Fire Control System ages, the problems with these precision mechanical sights are becoming increasingly related to moisture and foreign particles.

A study is being undertaken to determine the effectiveness of the present purging and dessicator replacement program. Some recent incidents involving moisture laden and corroded sights; and dessicator charges which have turned white in colour (a good dry charge is indicated by a deep blue colour), indicate that more education is required at all levels (operator and maintainer alike) to alleviate or at least reduce this type of hidden damage.

At the maintainers level, we are examining the possible use of a longer lasting and more effective dessicant charge; and a modification to telescopes which would allow the purging operation to be completed without removing the instrument from its mount.

Prevention is the key, for by the time an internal corrosion problem becomes apparent through a decrease in the equipment's performance it is too late for local corrective measures to remedy the situation and return the instrument to service. Prevention thru foresight, instead of maintaining by hindsight, when applied to our new generation of equipments, will increase their lifespan and accuracy.

THE PC VS BSAMMS

an essay by
Captain Albert Thibert

Since the title of this essay could be misleading, I would like to indicate, first off, that it would be very presumptuous to state that a PC could even compete with BSAMMS. To most of us in the field, BSAMMS is a conceptual form of automated LOMMIS reporting, briefly touched upon in classification training. This advanced database will eventually greatly alleviate current tedious manual practices and provide an up to the moment status report on vehicle availability. Some questions that are being raised; however, with the advent of the PC deal with BSAMMS user flexibility. In other words, will BSAMMS allow me to establish Unit scaling, control class C and D items in the toolcrib along with special tools and more daring, will it allow me to do word processing.

With the availability of cheap hardware and powerful software, it is not too unrealistic to expect more and more people to seize the initiative and employ their own equipment in their day to day job. Depicted in figure 1 is a weekly production report that was used to indicate the outstanding workload and the weekly production figures of a first line unit by the FCS Section of Weapons and Electronics Platoon, 4 Service Battalion. There exists, however, somewhat more powerful database programs which can handle data directly unto a floppy disc. These powerful programs open up a whole new realm of possibilities limited only by the availability of the hardware to the first line user.

The area which is of immediate interest is the activity around unit level scaling of spare parts. Current

methods require endless hours of sitting in front of a Microfiche verifying stock numbers, transcribing them into a ledger type sheet, establishing a maximum/minimum quantity and eventually getting a typist to produce a typewritten 8 ½ by 14 inch paper which by the time it is reproduced will contain obsolete stock numbers. An Infantry battalion possesses over 5000 different line items. Assuming that one entry would consist of 120 characters (16 for NSN, 40 for item description, etc) then 5000 items would take approximately 600,000 characters. If one standard 5 ¼ inch floppy disc can store up to 170K bytes or 170,000 characters, then the total unit holding of spare parts can be catalogued and stored in four diskettes. A far cry from the roughly two to three inch stacks of paper used for the listing. A notable advantage of this system is the ability to maintain this listing current and have immediate access to stocked items, re-adjust levels, update stock numbers, etc. The time, material and labour savings are phenomenal.

Added features that can be incorporated with this unit scaling, are the control of issue of class C and D items and special tools found in toolcribs. Stock levels can easily be controlled by the technician and replenished when he sees his maximum/minimum reach critical levels — not by what he can see in his bins, but by the actual minimum figures given him by his printout or CRT display (presuming, of course a controlled system). An appealing, but not essential feature is the ability to do word processing. Most first line

organizations are established for one Administrative Clerk 831 — though the trend has been to centralize this expertise away from maintenance organisations in recent years — nevertheless, this facet of the PC can greatly enhance the administration of first line organizations. Presenting letter quality drafts or better yet, transferring the desired work over a communications link for final review and approval to the appropriate department would be greatly time saving.

To speak of BSAMMS without actually knowing of its potential is ignorant. But for a brief glimpse of its abilities in the spring of 1981, BSAMMS appears to be a something in the future. The realities of the present, however, lie in availability of cheap hardware and sophisticated software which can be exploited immediately. The incorporation of scaling, both of spare parts and special tools is not a dream — the only limiting factor presently, is someone to devote some time and create a standard format on a popular available commercial database and enter the data. Word processing is a tool which no PC owner is without. Be it a sophisticated multi-lingual system or a simple program laboriously punched in from a multitude of PC reviews available on newstands.

There is no doubt the PC has taken a phenomenal jump in popularity and found its way into most homes. Even the simplest machine has proven useful as either an educational tool or a teaching toy. The swift market changes today are enough to make one's head spin trying to keep

THE PC VS BSAMMS

abreast of recent developments. Notwithstanding, one cannot afford not to get involved and become at least computer wise. To suggest that every officer possess a PC would be bold to say the least. But is it really? A recent article that appeared in the Stars and Stripes (local newspaper) declared that every officer cadet proceeding through one of the American Air Force Academy would be issued a PC on entry. Each student would have access to a campus

bulletin board where information such as grades and assignments could be collectively passed.

With the availability on the market of the various systems, concern should be given at standardizing within the Canadian Forces a complete microcomputer system which would readily adapt itself to innovation and be available to a wide spectrum of managerial levels. Once the basic software is established then its commonalty can be applied

throughout — no matter where the user is from. It is doubtful that the PC can compete with BSAMMS, nor is it the intent, but, the availability of this low cost tool to all levels of management, be it administrative or maintenance, would unquestionably enhance present efficiency. The question is not can the PC compete with BSAMS, rather can we afford to be without the PC.

ARTE ET MARTE

FCS for 1 R22eR As of 14 Mar 84

Wo No	Description	In-Date	Status	Estd Mhrs
706	TOW MOUNT	83116	Wt9 Parts	25
9707	TOW MOUNT	83116	Wt9 Parts	25
0252	TOW MOUNT	83116	Wt9 Parts	25
0253	TOW MOUNT	83116	Wt9 Parts	25
0254	TOW MOUNT	83116	Wt9 Parts	25
0255	TOW MOUNT	83116	Wt9 Parts	25
0256	TOW MOUNT	83116	Wt9 Parts	25
0257	TOW MOUNT	83116	Wt9 Parts	25
0683	C2 SIGHT UNIT	83122	Wt9 Parts	3
2334	PWR SPLY	83207	Wt9 Parts	0
2466	TSPE BSHNELL	83243	Wt9 Lbr	3
2467	TSPE BSHNELL	83243	Wt9 Lbr	3
2902	C2 SIGHT UNIT	83311	Wt9 Parts	3
3413	C2 SIGHT UNIT	83318	Wt9 Lbr	6
3579	AN/TVS 502	83332	Wt9 Parts	6
3579	AN/TVS 502	83332	Wt9 Parts	6
3581	AN/PVS 502	83332	Wt9 Parts	3
3584	BINO	83332	Wt9 Lbr	6
3586	BINO	83332	Wt9 Lbr	6
3587	BINO	83332	Wt9 Lbr	6
3588	BINO	83332	Wt9 Lbr	6
3590	BINO	83332	Wt9 Lbr	6
3627	BINO	83333	Wt9 Lbr	3
3629	BTRY CHGER	83333	Wt9 Parts	3
3786	TVS 502	83339	Wt9 Parts	0
3932	AN/TVS 502	83346	Wt9 Parts	3
3933	AN/TVS 502	83346	Wt9 Parts	3
3935	AN/TVS 502	83346	Wt9 Parts	3
4173	AN/TVS 502	84013	Wt9 Parts	3
4176	AN/PVS 502	84046	Wt9 Lbr	3
4182	AN/PVS 502	84013	Wt9 Lbr	3
4183	AN/PVS 502	84013	Wt9 Lbr	3
4184	AN/PVS 502	84013	Wt9 Parts	3
4186	AN/PVS 502	84013	Wt9 Lbr	3
4189	TARGET BOARD	84012	Wt9 Parts	3
4344	TRAVERSING UNIT	84026	Wt9 Parts	6
4413	BINO	84032	Wt9 Lbr	6
4570	84MM SIGHT	84046	Wt9 Parts	6
4610	BINO	84047	Wt9 Lbr	6

Summary

	No of WO	Mhrs
1. Waiting Parts	24	254
2. Waiting Labour	15	69
3. In-Progress	0	0
4. Completed WO	0	0
5. Remaining In-Shop	39	323

Figure 1.



A TRIBUTE TO THE "TIN TABERNACLE"

During both the First and Second World Wars many thousands of Canadian Army Personnel were stationed in Bordon, Hampshire, England. Not least of these were the some 4,200 members of the RCOC who, in 1944, while serving at 1 Canadian Base Workshop, Bordon, became part of the newly formed RCEME Corps. Thus, the long standing association between the REME and RCEME Corps as distinct engineering and maintenance elements began and still thrives between REME and the LEME Branch.

Bordon today houses Prince Philip Barracks and the School of Electrical and Mechanical Engineering (SEME) and in fact much of the accommodation forming the Technical Training Area of SEME was built by Canadian Engineers during the wars.

The Garrison Church of Saint George provided a haven as well as a place of worship for the soldiers in Bordon. When it was announced that the church, which affectionately had become known as the "tin tabernacle", had to be demolished, it was considered an appropriate opportunity for the LEME Branch to pay tribute to those Canadians who, for many years, considered Bordon their "home away from home". Thus began an exchange of ideas between Ottawa and Bordon on the best way of actually achieving this tribute in a meaningful manner. After several ideas were put forward, it was decided that the ground occupied by the tin tabernacle be converted into a Canadian style garden and a suitably inscribed stone, donated by the LEME Branch, be placed on the site.



The Unveiling

Background: Maj (Ret) David Bagnall-Oakeley — the Garrison Adjutant
Capt Peter Hannam, BEM — Director of Music of the REME Staff Band



Left to Right: Rev Adrian Bunnell (Prot), Rev Kevin O'Brien (RC), Mr. Ray Orgill and Mr. Norman Patrick of H.C. Patrick and Co. who produced the stone, Cpl Trevor Dougherty, Brigadier Mike Gardner — Commandant SEME, Col Bruce, Maj. Laffradi, Cpl Roderick Chisholm

Planning began in earnest late in 1984 after the demolition of the church had begun and by the end of May 1985, the old church site had been transformed into a pleasant garden area with several Canadian Maple trees dotting the area. Work had also been completed on a commemorative stone of Cornish granite which both paid tribute to the Canadians who had served in Bordon and would mark the exact spot of the original entrance to the tin tabernacle.

On 11 June 1985, a short, moving ceremony was held at the site during which our Colonel Commandant, Col (Ret) G.W. Bruce formally unveiled the commemorative stone.

The ceremony was opened with a fanfare by the herald trumpeters of the REME Staff Band after which Col Bruce gave a short address emphasizing the close ties of love and friendship which unite our two countries. Col Bruce then unveiled the stone and the Garrison Chaplains each said a short prayer. The ceremony concluded with another fanfare by the herald trumpeters.

The LEME Branch can indeed be proud of its part in the creation of this most fitting memorial which so tastefully recognizes those of our brothers who originally gave rise to the strong bonds which still exist between REME and LEME and their respective armies.

LEME ASSOCIATION 40TH ANNUAL MEETING

by Col (Retd) CA Millar

Originally formed in 1945 as the RCME Corps Association and later renamed the LORE Association, the 40th Annual Meeting of the Branch association was held at CFB Borden 17-19 Oct 85 with 46 LEME delegates in attendance from across Canada. Proceedings included the Annual General Meeting, a Council Meeting, three meetings of the Executive, and a Mess Dinner attended by the LEME Phase 4 officers at CFSEME and local LEME Cadet Corps officers.

Guest speakers included RAdm T.A.M. Smith, former Chief of Reserves, Mr N. Monsour, President of the Association of Professional Engineers of Ontario, BGen J.G.R. Doucet, Branch Adviser/DGLEM, BGen J.I. Hanson, BComd CFB Borden, Col J.J.G. Nappert, Commandant CFSEME, LCol R. Vincent, SSO Maint FMC, LCol J.P. Williams, PMO LLAD, LCol G. Ray, PMO AAW/LAV, and Maj M. Bowman, REME Exchange Officer CFSEME. Maj. G.V. Clark, Executive Secretary of the Conference of Defence Associations and Registrar for the Military Engineers Association of Canada also participated.

RAdm Smith gave an excellent address on the relationships between the military, the military organization, the civilian community, and the political arm under the topic "Who are we, and why are we here?". Mr Monsour spoke generally about APEO and noted that military engineering officers are no longer exempt under provincial legislation in Ontario. BGen Doucet gave a comprehensive outline

of activities throughout the Branch including personnel states and equipment procurement actions, BGen Hanson presented a "State of the LEME Union" message, Col Nappert welcomed members of the Association to The School and presented a current update on CFSEME, LCol Vincent gave a most informative and useful presentation on LEME in the Militia noting that the Mobile Command Structure Review is expected to produce great change for the Militia, LCol Williams spoke on The Low Level Air Defence project, LCol Ray outlined progress on the Anti-Armour Weapons and Light Armoured Vehicles projects, and Maj Bowman gave an informative outline of REME exchanges and comparisons between REME and LEME.

The new president of the Association is Maj Norm Graham from Brampton, Ont with LCol Rick Felstead of Kenora, Ont as 1st Vice-President. The two Honorary Vice-Presidents are now Col A.L. Maclean and BGen A. Mendelsohn. Chapters of the Association are currently active in Halifax, New Brunswick (Moncton), Ottawa, Kingston, Toronto, Winnipeg and Vancouver as reported at the Annual Meeting. Reports were also received from Militia maintenance companies and service battalions across Canada.

Discussion included the preparation of resolutions urging the Government

of Canada to take the necessary steps to facilitate participation by Canadian industry and universities in US Strategic Defense Initiatives of benefit to Canada, and also that a policy statement with priorities and mandate be issued by the Government recognizing the primacy of CF readiness and sustainability requirements for a defence industrial base. 14 other resolutions addressed important issues of concern to the Reserves and the Regular Force.

The LEME Association offers retired and regular force RCO(E)/RCME/LORE/LEME officers an opportunity to assist in the development of the LEME Branch, to represent the interests of the Branch at the Conference of Defence Associations, to facilitate cooperation between LEME units of the Regular Force and the Reserves, and to continue "service" friendships, principles and ideals. The Association takes a direct interest in current military activities, technology, international affairs, and the welfare of the LEME Branch. Members are encouraged to make suggestions, to discuss topics of concern, to prepare resolutions and position papers, and to generally enhance the effectiveness of the Branch.

For further information on membership in the LEME Association, please contact your nearest Chapter Chairman.

CHAPTER	CHAIRMAN	
Halifax	LCol AR McLaughlin, 6286 Oakland Road Halifax, NS, B3H 1P2	429-7023
New Brunswick	Col TE Gautreau, 218 MacBeath Avenue Moncton, NB, E1C 7A3	854-1391
Kingston	Col AL Maclean, 307-185 Ontario St Kingston, Ont, K7L 2Y7	548-7984
Ottawa	Maj TH Westran c/o Davis Engineering, 1260 Old Innes Road, Ottawa, Ont, K1B 3V3	748-5500(B)
Toronto	Capt WM Ruddock, 53 Himount Drive Willowdale, Ont, M2K 1X3	226-3705(R) 889-7890(B)
Winnipeg	Maj E Stones, 20 Heather Road Winnipeg, Man, R2Y 0G3	
Vancouver	LCol GL Marrotte, 1395 Mathers Avenue West Vancouver, BC, V7T 2G5	926-3681

RETURN TO ITALY



Capt Gordon Hansford (Ret'd)

Like many veterans of the Italian campaign of 1943-45, I had hoped to return to that country some day. Being selected as the representative of the Royal Canadian Electrical and Mechanical Engineers was, to me, a great honour, especially since I could think of many ex-comrades who were more deserving than myself for the privilege. After meeting at Montreal on the seventh of May, 1985, representatives of all the Regiments, Corps, and Services, as well as the Royal Canadian Navy and R.C.A.F., flew via Air Canada from Mirabel, landing in Rome on the eighth.

Several ex-generals were in the delegation, and a Victoria Cross winner, Ernest (Smoky) Smith accompanied us as well. After a good night's sleep at our hotel the delegation was bussed to Rome's city hall where the Mayor, Signor Ugo Vetere, presented each of us with a very fine bronze medallion commemorating the liberation of his city forty-one years ago. A wreath was laid by the delegation at the Victor Emmanuel monument in Rome, followed by a visit to Rome War Cemetery, where a wreath was laid by the head of the delegation, the Honourable Allan McKinnon, PC, MC, CD, MP. A bus tour of Rome ensued, encompassing St. Peter's and the Vatican, the Colosseum and other interesting historical sites.

In the evening, members of the group were presented to the Canadian Ambassador, Mr. Claude Charland, at a reception at his residence. The next day we travelled to the battlefield of Cassino, where eight hundred and fifty-five Canadians are buried. In addition, the names of one hundred and ninety-two more are recorded on large stone tablets, those who were killed in Sicily and Italy and have no known graves.

The Polish war cemetery was also visited, as was the Abbey of Monte Cassino, which has been restored to its pre-war splendour. The view from the Abbey is breath-taking in its beauty, but we remembered that the same view provided the German defenders of the position a superb field of fire. They took full advantage of this in the months the allies attempted to storm the position which blocked the way to Rome, and the large cemeteries of all the allies involved, British and Commonwealth, American, Free French, Polish and others bear witness to this.

On the eleventh, we travelled to Anzio to lay wreaths at the Beach Head Cemetery, where numbers of Canadians of the First Special Service Force, a mixed Canadian-American unit, are buried. A small medallion was presented to each member of our group, depicting a little orphan girl who was befriended by our troops and was killed ten days later by a German shell. It reminded all of us of the fact that the innocent and helpless suffer from war, as much as the troops actually engaged in battle. Caserta Cemetery was next visited where wreaths were laid and we then proceeded to Naples for an overnight voyage to Palermo, Sicily.

The next day we embussed for Agira, where four hundred and ninety Canadian dead of the Sicilian campaign of July and August, 1943, are buried. Here we met the band of the Royal Canadian Regiment, of Gagetown, New Brunswick, and the Pipes and Drums of C.F.B. Lahr, Germany. Their music was soul-stirring, especially when they combined to play "Amazing Grace". It was a fore-runner of all of their performances at ceremonies to come. A guard of honour from the First Regiment, Royal Canadian Horse Artillery, accompanied the delegation at all ceremonies. Their dress,

discipline and conduct were above criticism, and their drill was flawless.

The contrast between the Sicily of forty years and today was striking. Then, the dry dusty hills of the island were studded with small, dirty, poverty-stricken villages, connected by tortuous mule-tracks. Today, straight, paved, super highways called "autostrada" connect clean, modern, towns and cities, passing green, fertile, fields of corn, well cared for olive groves and vineyards. Valguanera and Piazza Armerina were visited, with lunch at the latter town. We then returned to the modern port of Palermo to board the ship for Naples.

The next morning we went by bus to the Moro River cemetery near Ortona, on the Adriatic coast. Here one thousand three hundred and seventy-five Canadians are buried. Most of these men were killed in December, 1943, when the town was taken by the First Division and the First Armoured Brigade. The high point of the entire pilgrimage, for me, occurred when I was requested to lay a wreath for R.C.E.M.E. Association, especially since I later found in the cemetery, the graves of several of my old friends, including that of Lance Corporal Wylie Bennett, of Kentville, N.S., who was killed on the twenty-eighth of December, 1943, at San Vito.

We continued to travel throughout Italy, visiting cemeteries at Ancona, Montecchio, Gradera, Coriano Ridge, Rimini, Cesena, Ravenna, Villanova and Florence. In Ravenna a street was named in our honour "Viale dei Canadesi" and we were presented with medallions featuring the coat of arms of the city. In Rimini and Ravenna we paraded through the town, headed by our bands.

An impressive moment occurred when, at Villanova Cemetery, we slow-marched between rows of grave stones. A member of the R.C.H.A. said he had never seen the slow march

RETURN TO ITALY

done better, in spite of forty years lack of practice! There were many emotion-filled moments, when a veteran pointed out a spot where he had been wounded, or had seen a pal killed. Rank played no part in the proceedings. Ex-privates and corporals swapped stories with ex-colonels and generals. The Italian authorities treated us with the utmost consideration and respect, and many of the ceremonies were attended by members of Italian ex-service organizations, as well as a large number of Italian citizens of all ages.

I must not forget to mention four young Canadian teenagers who accompanied us to Italy. They were

selected for this trip as a reward for writing especially fine essays on the subject of Remembrance Day. They came from the four main regions of Canada and were friendly and helpful to all, especially the disabled members of our group. With young people like these, Canada need have no fear for the future.

The Commonwealth War Graves Commission are to be commended on the neat, orderly and well-groomed appearance of all of the cemeteries. Relatives of the more than six thousand Canadians buried in Sicily and Italy may rest assured that the final resting place of their loved one is maintained in a manner befitting the

grave of a hero.

We headed back to Rome on the nineteenth of May and flew back to Montreal via Alitalia, and at Montreal we said goodbye to our comrades. We had made many good friends on the trip. A great deal of credit is due the Department of Veteran's Affairs who did a marvellous job of organizing and conducting the pilgrimage. I believe that the present day members of the Land Electrical and Mechanical Engineers can feel proud of the sacrifices of their predecessors, the R.C.E.M.E. and before them, the R.C.O.C., and I feel sure that they will, in turn, live up to the finest traditions of the Corps.

LEOPARD MAIN BATTLE TANK REPAIR AND OVERHAUL AT 202 WORKSHOP DEPOT

Starting in November 86, 202 Workshop Depot Montreal will be overhauling 5 Canadian Leopard Tanks and 5 German Leopard Tanks; the next cycle, in November 87, will see 5 Canadian and 20 German tanks. The project brings an opportunity to 202 Workshop to upgrade its overall accommodation and equipment. The injection of new ideas and programs is bringing increased activity. A pilot project commenced in April 85 using a German Leopard A2 Tank from CFB Shilo Manitoba and on August 85, 202 Workshop, started the pilot project on a C1 Leopard tank which had been involved in an accident at CFB Gagetown.

202 Workshop's involvement with the Leopard began with a decision of the SRB on 15 Mar 1982 to task 202 Workshop to develop technical support and expertise for the Leopard overhaul. The Leopard Tank Overhaul Project was approved by PCB on 12 July 1984 and entails the complete

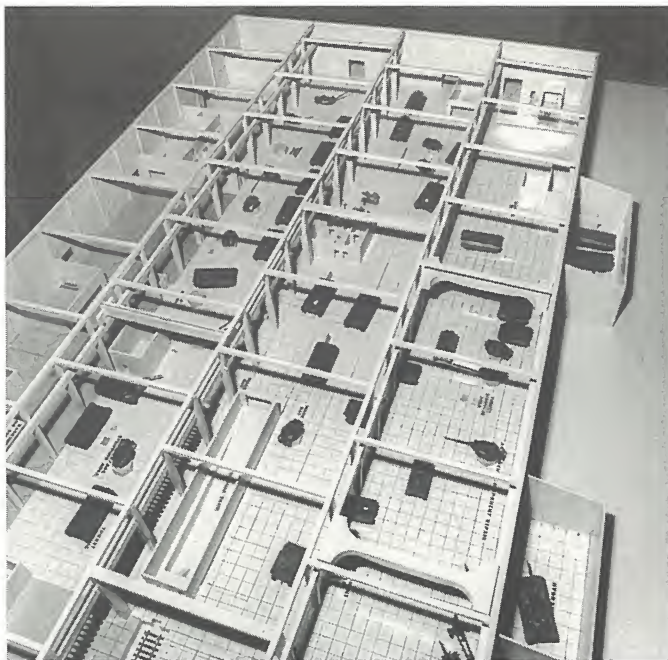


Col G.C. Tousignant, CO 25 CFSD (right), hands over the keys of the first German A2 Leopard tank to Col L.A. Leflar, CO 202 Wksp Dep, after receiving them from Lt-Col H.D. Duchsherer (left) German Military Representative, Logistics Command Canada. 20 German Leopard A2 tanks will be overhauled each winter when the project gets fully underway.

LEOPARD MAIN BATTLE TANK REPAIR AND OVERHAUL AT 202 WORKSHOP DEPOT



Mr. André Joncas, Mr. Claude Venne, and Mr. Paul Sorbini stand behind the mock-up of Building 3 on Longue Pointe Garrison. Changes will be completed in the summer of 1986 to allow for overhaul of German and Canadian tanks beginning in November 1986.



Building 3 mock-up for Leopard rebuild. Major projects include a larger fording tank, improved paint shop, a redesign of the workspace, new cranes, washing facilities, pneumatic tools, and an outdoor test track.

overhauling of the tanks as well as the 3rd/4th line repair of assemblies arising from the entire Canadian Leopard fleet. The project also includes the overhaul of German Leopard A2 Tanks in Canada, and Cdn APCs in Germany as part of a collective agreement with the German Army.

The cost of new facilities construction at 202 Workshop is estimated at 3 million dollars. These facilities include a test track, clean optronic and electronic rooms, and hydraulic shop, renovation to the transmission shop and to the existing fording tank. The entire project provides an opportunity for 202 Workshop to improve our management and technical expertise, plant construction, and equipment by doing the most technical, complex task in the unit's forty year history. Twenty eight additional person/years was approved for 202 Workshop and four additional positions to 25 CFSD to assist in the task.

As 202 Workshop will continue to rebuild Armoured Personnel Carriers (APCs), the Leopard schedule calls for

completing 20 tanks in 20 weeks between the period Nov to Mar of each year. To do such a quick turnaround, special pallets are being designed and manufactured to transport assemblies from building 3, where assembly/disassembly will take place, to building 10 (500 meters away) where most individual components will be overhauled. German parts will be shipped to Canada every spring for the next overhaul cycle during the following winter when the German tanks are not required at CFB Shilo.

Visits and exchanges have taken place with Germany and Australia where Leopard tanks are currently being overhauled. As the third and forth line equipment were not bought with the acquisition of the tanks in 1975 there are great expenses involved to set-up this project. Special tools and test equipment must be either purchased or manufactured locally, jigs/fixtures/test stands must be designed and manufactured, and paint shops, cranes, washing facilities must be renovated and improved.

A prototype of building 3 was built

by Mr. Paul Sorbini, 202 Workshop Depot master cabinet maker. Mr. André Joncas designed the prototype using his considerable skills in modeling techniques to ensure the proper scale and construction. Mr. Claude Venne painted the model. By using the unique skills of these personnel the unit developed a method to immediately see the effects of configuration changes to avoid changes and delays after construction of building 3 begins.

202 Workshop Depot sees this project as a way to improve our greatest resource, our workers. The jump in technology has meant sending many technicians on specialized Leopard courses. Two IBM PC XT Micro Computers have been purchased to take care of German spare parts and Leopard scheduling. Great cooperation has been received from the Union of National Defence Employees, the International Brotherhood of Electrical Workers and the Professional Institute of the Public Service. All concerned realize the importance of this project.

THE PC vs BSAMMS — GOOD IDEA BUT . . .

By Maj Marcel Germain

The article entitled "the PC vs BSAMMS" was welcomed. It shows that more and more maintainers recognize the need for automation. To assist those who would like to find out more about BSAMMS, I recommend the following readings:

- The article on BSAMMS in the Spring 84 issue of the technical bulletin; or
- The System External Specifications distributed to the bases in Jan 85.

To avoid any misconception, I want to emphasize the BSAMMS will not be a conceptual form of automated "LOMMIS" reporting. BSAMMS is intended to support the workshops in their day to day management, operations and administrative functions. These functions can be translated within a workshop as:

- Personnel Accounting;
- Material Accounting;
- Parts Planning;
- Long Term Planning;
- Training;
- Workshop Operations; and
- Management Reports.

To this end, it is fundamental that the data captured throughout the organization be integrated so that the aggregated data can be of benefit to all maintainers in the performance of their duties.

I agree that PCs have gained a large popularity among the workplace. However, their applications are largely limited to single or few users in a stand alone mode. At the section or platoon level, they would certainly be of value. However, a platoon is only one element of the workshop. The daily changes at the section or platoon level are also essential to others such

as the Control Office, Orderly Room, Workshop Support Officer, Workshop Commander, etc. To ensure that all users have access to up to date information would require the integration of several PCs in a complex network arrangement. In addition, the quantity of information contained in a workshop far exceeds the storage capacity of even the more powerful PCs.

To conclude, I appreciate that maintainers are anxious to receive the long awaited BSAMMS. However, as indicated in the Spring 84 article, much work had to be devoted over the past years to standardize the operating procedures of all workshops in order to automate. On the brighter side, a prototype of the national BSAMMS will gradually be introduced at Winnipeg and Gagetown during this year with an implementation at the national level scheduled for early 88.

LEME OCCUPATIONAL BADGES



VEH TECH
TEC V
411



FCS TECH L
TSCT(T)
430



W TECH L
TEC A(T)
421



MAT TECH
TEC MAT
441

After almost a year of discussion at Trade Advisory Committees and other development work; approval has been given for the designs of the LEME Occupation Badges. The Badges shown in the accompanying photo were developed by the technicians of the trades, some after many attempts to agree on a design that would be able to be reproduced in cloth.

You will notice that the design for the Mat Tech badge is radically different from the proposal shown in the last issue of the Journal. Although it was a fine design the first badge could not be successfully

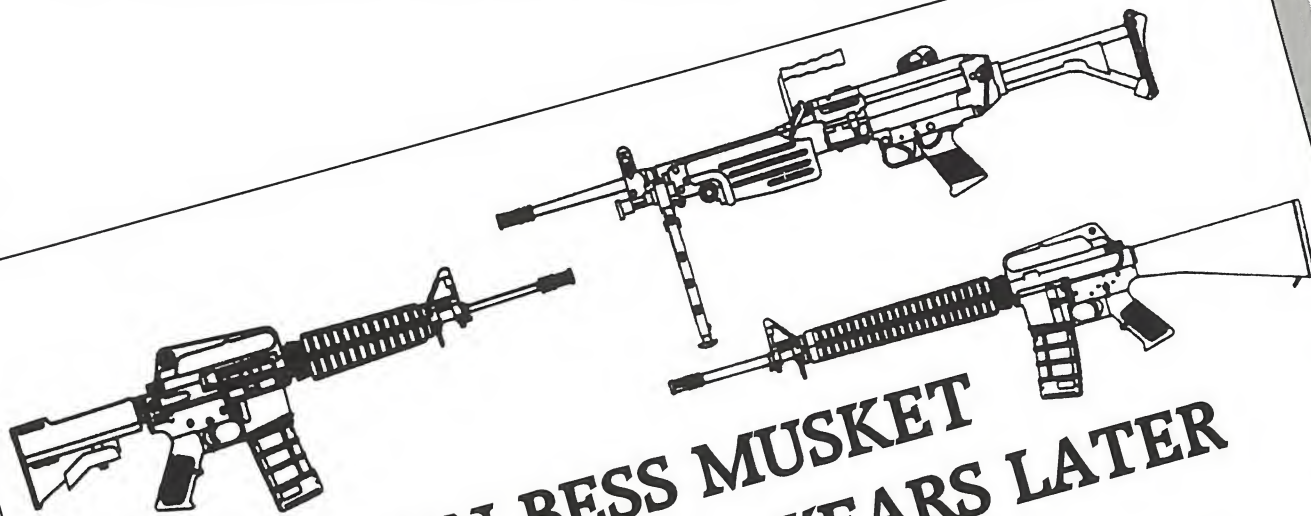
manufactured in cloth. The same problem was experienced in the prototype of an earlier proposal for the FCS badge.

The former RCEME will no doubt recognize the Vehicle and Weapon Tech badges, but for the younger set, they are basically the same design that was worn up to the mid Sixties. The two other badges are new designs. For those of you who look for symbolism in the designs they are pretty well self-explanatory:

- Veh Tech — an internal combustion engine piston superimposed on a wrench;

- W Tech L — a gun wrench superimposed over a cannon;
- FCS Tech — the lightning bolt indicating electricity with tweezers indicating precision work; and
- Mat Tech — a welding torch superimposed over a machinist's wrench.

While actual available dates of issue have not been determined, it is hoped that the badges will be available in time for you to wear them on the new uniform. These badges carry a great deal of meaning, our technicians will be able to wear them proudly.



THE BROWN BESS MUSKET — 250 YEARS LATER

by Maj D.C. Knight
Deputy Project Manager/Systems Engineer, SARP

Have you ever been to an arms exhibition? Ever see how the users and requirements people cluster like bees around the latest tank — the one with the laser-sighted, gyro-stabilized, auto-loaded self-cleaning gun, nuclear power plant, air cushioned ride and magnetic force field armour. Or how about the crowd around the new communications system — the one that has a microphone in the lapel button of every section commander which flashes a secure-encrypted, frequency-hopping signal to a geostationary, laser-protected satellite that sorts up to a million incoming messages a second and retransmits the command in a micro-second to the receiver in the helmet of the man standing two feet away from him. Well, if you get past these booths, down the back, near the pipes in the corner of the hanger is a small booth with a six foot folding table covered with newspaper. If you want coffee — the representative has a thermos in the briefcase. He sells guns. In historical terms, he gets up to a front booth once every generation.

Guns are easy to make — right? There is no new technology involved — right? Just simply metallurgy and machining — all mundane state-of-the-art materials and techniques. You can do it in any machine shop! So why do we need a Project Management Office to run the Small Arms Replacement Project? Any LEME captain should be able to do it — part time of course — right? OK — now have I got a deal for you. There is this bridge that my uncle is selling . . .

Manufacturing gun barrels has come a long way in the last few hundred years. One historical method was to twist metal strips around a mandrel (that's a long rod). The strips were then heated in a gunsmith's forge to white hot and hammered until the metal fused. Over a hundred heatings would be required to create a gun barrel. Depending on the skill of the gunsmith, the barrel might only be a millimeter out of round — which was not overly important when you consider that the bullets of the day had to roll down the tube from the muzzle without sticking. A wad was then rammed down on top of it to keep it from rolling back out. Accuracy was defined as the ability of the bullet to get out of the barrel, and have a

fifty-fifty chance of hitting a man at forty yards. If you did get a hit, the 16mm lead ball and the medical facilities of the time usually ensured that the hittee lost all interest in a return engagement.

Today, we are a little bit more advanced in gun barrel technology. (By now certain members of SARP will be squirming over my use of the word "gun". Look up the definition in the dictionary. The difference between an "infantry rifle and an artillery rifle is a matter of degree. Are we supposed to change the name of the weapon after 10,000 rounds have smoothed out the bore and it is no longer rifled? Besides, we call others a light machine GUN!) When SARP was investigating new small arms, there were several different methods used by the competing manufactures.

One manufacturer used a method known as button-broaching. In essence, a piece of bar stock of the appropriate material is drilled and reamed to a size slightly smaller than the required diameter of the bore. Depending on the manufacturer, it may be honed to a very smooth surface. Then the barrel is put in a machine and a small very hard plug or "button" is forced through the bore by hydraulic pressure. The button has the mirror image of the rifling and squeezes out the bore to the appropriate size and presses the rifling grooves in place. The button turns at

the appropriate rate to give the twist of the rifling. The sizing of the button is precise to account for the elasticity of the barrel material as it relaxes and shrinks slightly as the button passes through. The exterior surfaces of the barrel are now machined to the appropriate shape. The chamber, where the cartridge case will fit, is also machined to a precise tolerance.

Then, to increase barrel life, the interior of the barrel is given a coating of chrome in an electroplating process. The exterior of the barrel is also electroplated with phosphate as a preservative and rust protector. The barrel is now ready for further processing such as drilling holes for the gas port, threading the ends to take the flash suppressor, machining surfaces for the sight mountings, and other operations.

Another manufacturer uses the hammer forging process. In this case, the barrel blank is drilled and reamed to a size larger than the required bore diameter. The interior of the barrel is usually honed to a very smooth surface using a multi-stage honing machine or a equivalent process. At this point the barrel is placed in a fixture with a mandrel inside it. The mandrel is a very hard, very precise insert that has the mirror image of the rifling and twist on it. The barrel is hammered down on the mandrel, creating the rifling and the twist in the barrel. The quality of the barrel is very dependent on the smoothness of the barrel before forging. The drilling, reaming and honing are very important parts of the process.

After forging, the chamber is machined and the barrel is phosphated and chromed similarly to the button broaching process. Because of the stresses set up in the material by the hammer forging, the barrel may be heat treated to relieve stress after forging.

In Canada, our C7 rifle and C8 carbine barrels will be made by the hammer forging process, but with a difference (only in Canada you say?) We are going a step further in that the barrel and chamber will be hammer forged together in a single pass. Thus we will eliminate the additional

machining operation in making the chamber. The main difficulty here is that the initial bore diameter must be much larger than the final bore size because it must start larger than the ultimate chamber size. The barrel alone can be drilled to about 8 mm and hammered to 5.56 mm, but we have to start at over 11 mm and hammer to 5.56 mm. This creates additional stresses in the material. However, the results achieved by the preproduction weapons were very encouraging.

Why are these operations so critical? After all, the greatest source of inaccuracy is the man, and depending on what the weather is like, when he was last fed, how many of his friends were killed last night, and how many 122 mm rounds have hit his position in the last two hours, this can be a major factor indeed. Also the rifle has an automatic feature to it that lets a soldier fire at a rate of \$400.00 per minute for three seconds without changing magazines. But, when we produce the weapon, we want it to have a certain level of precision.

Precision — accuracy — the same thing — right? Nope. Accuracy is the ability to hit a target. This is made up to many factors, and usually can be adjusted by factors external to the barrel. Adjust the sights, calculate the crosswind, give the shooter a cognac, etc. Precision is the ability to put successive rounds as close to the same point as possible. This is mainly dependent on the rifle itself and the ammunition. The initial standard specified for the C7 rifle requires that all members of a ten round group be within a 74 mm diameter circle at 50 meters. That's roughly the size of a squirrel head for those of you who have heard of Davy Crockett. But then his rifle was a special one, and we require this of all of ours. And in practice, most of the C7 rifles group in less than a 50 mm diameter circle at 50 meters.

We also want our barrels to maintain their precision over a certain life, and that is where we start having a few problems. The gun barrel is a very hostile environment. Hot, corrosive gases move at high velocity

behind a hard plug that scrapes the surface material away, leaving behind bits of foreign material. It is cleaned by various people, some of whom will treat it with tender loving care and some of whom will empty the water out and clean it only at the end of the exercise. What can we consider the life of the barrel in normal use (snapping the metal banding off ammunition boxes is not normal use!) Well — one MG34 GPMG at Omaha beach is reputed to have fired 25,000 rounds between dawn and noon on 6 June 1944, but that is probably not a normal condition. The average soldier may shoot 200 rounds a year through the rifle, and we keep the rifle for 20-30 years so is 6000 rounds the magic figure? In reality, in peacetime, the rifle will have more blank rounds fired through it than live rounds. So what sort of barrel life do we require?

Data which SARP has suggests that the C7 should hold its precision quite well through 6000 rounds with possibly a 20% increase in group size by 10,000 rounds. Even at 10,000 rounds, there is a 95% confidence that all rounds will be in a 110 mm diameter circle at 100 meters. (Squirrel for supper, but it might be squirrel stew). So the process which we are using to manufacture the barrel would appear to be reasonable. Our rifles will hold a good precision for their probable peacetime life — or until coffee break on D Day — whichever comes first!

So, the next time you go to an arms bazaar, do me a favour. Go down the back and talk to the man who sells guns. Tell him from me that his C7 preproduction rifles performed beyond our wildest hopes in their tests. Tell him that production will start momentarily, and his product should be in the hands of troops starting in January 1987. But don't drink the coffee — he has a large stock left over from when he had a front booth a couple of years ago. It must be getting a bit cold and furry by now.

I'd tell him myself, but I won't be there. My position only gets filled every twenty or thirty years, and only for a short time at that. But he'll be there . . .

CHANGE OF BRANCH CHIEF WARRANT OFFICERS

CWO Andy Levesque being presented his Certificate of Service by BGen Doucet.

CWO John Sloan



Since the last edition of the Journal there have been a number of changes in the Br CWO office. CWO Andy Levesque took over the position from CWO Tom Jones in early Aug 85.

Mr. Levesque settled into the job with many visits to Units and Bases across Canada occupying his time. His

talents were obvious to all who working with him. They were also noted by others and shortly after Christmas he was offered a position in Bombardier. It was a job he felt he could not refuse and he left the Service after 29 years when he started his career as an Apprentice. We all wish Andy success in his new career.

The new Br CWO is CWO John Sloan who took over the position in Apr 86. CWO Sloan was previously the Production Officer of CFB Ottawa. In the few months since taking over the position, CWO Sloan has already visited a number of Bases and units.

LETE

by Capt A.W. McDonald

On 26 Sept 85, the Associate ADM (Mat), MGen G MacFarlane presented the ADM (Mat) Merit Award to Mr. R.T. King of the Land Engineering Test Establishment. Mr. King was honoured with this award for performance at an unusually high level over an extended period of time. In more than forty years of dedicated and conscientious service to DND, he worked in all three environments, consistently demonstrated a high level of professional efficiency and effectiveness and a rare high sense of devotion to his work. At LETE, he was mainly involved in the design of new electronic equipment and modifications to existing equipment. Prior to his retirement in September, 1985, Mr. King was considered to be the Canadian Forces expert on the Boffin Fire Control System. Well done and happy retirement, Bob!



MEDAL OF BRAVERY

MWO G. Forward

FCS TECH (L)

CFB Gagetown



On 12 May 1984, Warrant Officer Gerry Forward, of Fredericton, New-Brunswick, was contacted by City Police regarding a suicidal servicewoman previously supervised by him. Responding to the call, he went to her apartment where police briefed him that the distraught and apparently drugged woman was armed with a pistol, and very uncooperative. Although untrained for such situations and warned that he would have minimal cover, Warrant Officer Forward volunteered to attempt to save the woman rather than risk her death by waiting.

Allowed by the woman to enter, he began to win her confidence, convincing her to place the gun on the floor. As he slowly moved nearer, she sensed his purpose, seized the weapon and threatened him. Calmly, he began again. Eventually, she placed the gun on the floor. This time he moved quickly, pinning her to the couch with the coffee table and grabbing the pistol. The police rushed in to take control. Warrant Officer Forward's judgement was correct: the woman would soon have succumbed to an overdose of drugs and alcohol.

LEME BEATS NAVY AT THEIR GAME

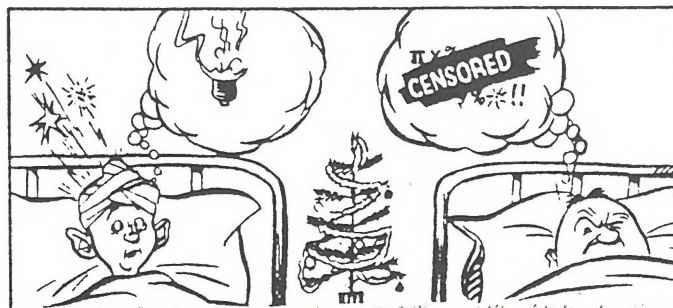
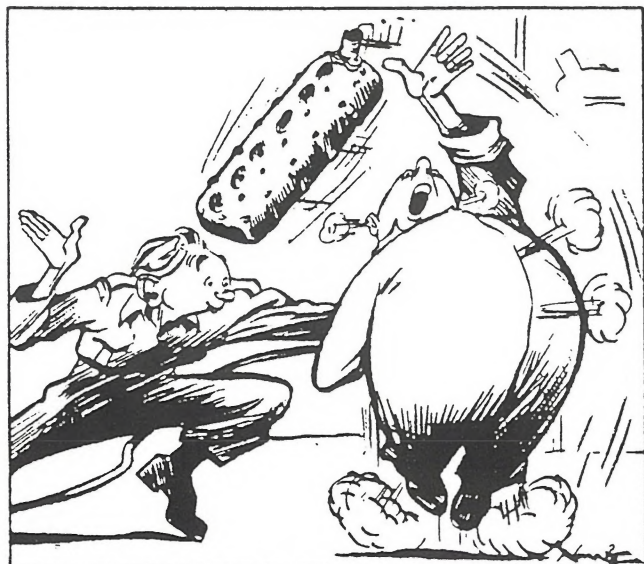
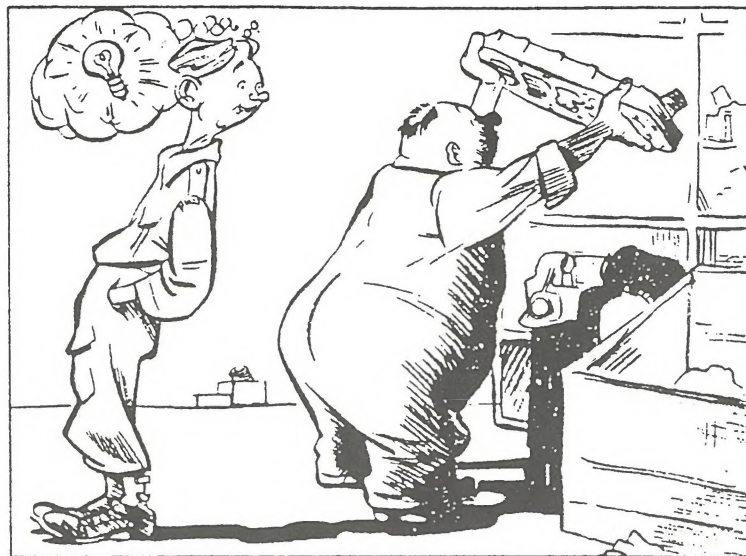
As part of the 75th anniversary of the navy, Base Maintenance, CFB Esquimault, entered a strong army contingent in the MARPAC "Beard Growing Contest". Capt Con Jeronimus checks Cpl Dave Haley's three week old beard. Also in the contest (left to right) are Pte Jim Wright, Pte Joe Michaud, MWO Dave Davies, Sgt John MacLeod, Kevin Neish (driving), Cpl Ken Warner, WO Gary Rosa, Wayne Cotter, Capt Jeronimus, Cpl Fred James, Cpl Haley, MCpl Jim Steffan and Cpl Ben Manning. This picture was taken in mid-March.

The contest ended on 28 June 1985, with finalists chosen in three categories (best, most colourful and longest). MCpl Jim Steffan, second from the right, won the 'best beard' category. Congratulations Jim!



The CAM-PAINS of BENNY BOOB

Time on your hands Benny? What price a spot of horseplay? Just for a laugh y'know - brighten the place up. Nothing like a good practical joke to . . .



What—no laughs? And the doc says Joe is injured rather seriously! Don't get us wrong—we're the last people to say you should go around with a sour puss all day—but horsing about with air guns in a shop where there's already enough tools and machinery to cause plenty of trouble is not funny.

NO LAUGH IS WORTH A PERMANENT INJURY.